FIR/R142

LIBRARY
JUL 2 1974
FISH & WILDLIFE SERVICE

Report of the seventh session

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH

Rome, 17-24 October 1973

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ROME, 1974

DOCUMENTS OF THE FISHERY RESOURCES DIVISION OF FAO DEPARTMENT OF FISHERIES

Documents which are not official FAO publications are issued in several series. They are given a restricted distribution and this fact should be indicated if they are cited. Most of them are prepared as working papers for meetings, or are summaries of information for use of Member Governments, organizations, and specialists concerned. These series are the following:

FAO Fisheries Report **FIR/R (No.)**
FAO Rapports sur les pêches
FAO Informes de pesca

Special groups of synopsis are identified by symbols followed by classification numbers based on indexed code of "ASFA":

SAST	Data concerning certain species and fish stocks
MAST	Information on methods and subjects
OT	Oceanographic data
IT	Limnological data

FAO Fisheries Technical Papers **FIR /T (No.)**
Documents techniques FAO sur les pêches
Documentos técnicos de la FAO sobre la pesca

Special groups of Technical Papers are identified by:

RE	Indexed list of experts and institutions drawn from Registers maintained by the Fishery Resources Division
IN	Provisional editions of inventories and lists of fishery data stored and maintained by the FAO Fishery Data Centre
CB	Lists of periodicals, special sections of "Aquatic Sciences and Fisheries Abstracts (ASFA)", special bibliographies and papers concerning documentation problems
MFS	Provisional editions of "FAO Manuals in Fisheries Science"
WAFR	Provisional reviews of fisheries resources and their level of exploitation, by regions or by species groups, whithin the World Appraisal of Fishery Resources system

Some documents also have another identification, if, for example, they have been contributed to a meeting for which papers have been numbered according to another system.

DOCUMENTS DE LA DIVISION DES RESSOURCES HALIEUTIQUES DU DÉPARTEMENT DES PÊCHES DE LA FAO

Des documents qui ne figurent pas parmi les publications officielles de la FAO sont publiés dans diverses séries. Ils font seulement l'objet d'une distribution restreinte, aussi convient-il de le préciser lorsque ces documents sont cités. Il s'agit le plus souvent de documents de travail préparés pour des réunions, ou de résumés d'information à l'intention des gouvernements des pays membres, ainsi que des organisations et spécialistes intéressés. Ces séries sont les suivantes:

FAO Fisheries Circular **FIR/C (No.)**
FAO, Circulaire des pêches
Circular de Pesca de la FAO

Des catégories spéciales de synopses sont identifiées à l'aide de symboles suivis des chiffres de classification basés sur le code d'indexation de la «ASFA»:

SAST	Données sur certaines espèces et populations de poissons
MAST	Renseignements sur des méthodes et des sujets
OT	Données océanographiques
IT	Données limnologiques

Des catégories spéciales de documents techniques sont identifiées à l'aide des symboles suivants:

RE	Listes indexées d'experts et institutions tirées des registres tenus à jour par la Division des ressources halieutiques
IN	Editions provisoires des listes et inventaires concernant les données sur les pêches accumulées et mises à jour par le Centre de données halieutiques de la FAO
CB	Listes de périodiques, des sections spéciales de la «Aquatic Sciences and Fisheries Abstracts (ASFA)», des bibliographies particulières et des articles sur les problèmes de documentation
MFS	Editions provisoires des «Manuels FAO de science halieutique»
WAFR	Synthèses provisoires des ressources halieutiques et leur niveau d'exploitation, préparées, par régions ou groupes d'espèces, dans le cadre du Programme mondial pour l'évaluation des ressources halieutiques

Certains documents portent parfois d'autres numéros d'identification, par exemple s'ils ont été préparés pour une réunion dont les documents ont été marqués à l'aide d'un autre système.

DOCUMENTOS DE LA DIRECCION DE RECURSOS PESQUEROS DEL DEPARTAMENTO DE PESCA DE LA FAO

Esta Dirección publica varias series de documentos que no pueden considerarse como publicaciones oficiales de la FAO. Todos ellos tienen distribución limitada, circunstancia que debe indicarse en el caso de ser citados. La mayoría de los títulos que figuran en dichas series son documentos de trabajo preparados para reuniones o resúmenes de información destinados a los estados miembros, organizaciones y especialistas interesados. Estas series son las siguientes:

FAO Fisheries Synopsis **FIR/S (No.)**
Synopsis FAO sur les pêches
Sinopsis FAO sobre la pesca

Grupos especiales de sinopsis se distinguen con las siglas siguientes, seguidas por números de clasificación que se basan en las claves de los índices de la «ASFA»:

SAST	Datos relativos a ciertas especies y poblaciones
MAST	Sinopsis sobre métodos y materias
OT	Sinopsis sobre oceanografía
IT	Sinopsis sobre limnología

Grupos especiales de documentos técnicos se identifican por las siglas siguientes:

RE	Listas índices de expertos y de instituciones tomadas de los registros que se llevan en la Dirección de Recursos Pesqueros
IN	Ediciones provisionales de los inventarios y listas de datos de pesca acumulados y guardados por el Centro de Datos Pesqueros de la FAO
CB	Listas de periódicos, secciones especiales de la «Aquatic Sciences and Fisheries Abstracts (ASFA)», bibliografías especiales y trabajos relativos a los problemas de documentación
MFS	Ediciones provisionales de los «Manuales de la FAO de Ciencias Pesqueras»
WAFR	Reseñas provisionales de los recursos pesqueros y de su estado actual de explotación, por regiones o por grupos de especies, en el marco del sistema mundial para la evaluación de los recursos pesqueros

Algunos documentos tienen también otra identificación si, por ejemplo, son contribuciones a una reunión cuyos documentos han sido marcados con arreglo a otros sistemas.

REPORT OF THE SEVENTH SESSION

OF THE ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH

Rome, 17 - 24 October 1973

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, January 1974

PREPARATION OF THIS REPORT

This is an edited and approved version of the Report of the Seventh Session of the Advisory Committee on Marine Resources Research (ACMRR : 7/73/WP.30) as amended at the closing session. The Report of the ACMRR/IABO Working Party on Aquaculture, and of the ACMRR Working Party on Scientific Advice to Fishery Management and Development Bodies (under the title "The Scientific Advisory Function in International Fishery Management and Development Bodies") are being issued as Supplements to this Report.

Distribution:

FAO Department of Fisheries
FAO Regional Fisheries Officers
ACMRR
Selector SM
Member Countries
UN Organizations members of ICSPRO
IOC
IABO
UNEP
Members of ACMRR Working Parties

Bibliographic entry:

Seventh Session of the Advisory Committee on Marine Resources Research. Rome, 17-24 October 1973 (1974)
FAO Fish.Rep., (142):45 p.
Report of the .....

Conference report. Development of FAO activities. Living aquatic resources - evolution and surveys. Aquaculture. Environmental studies. IOC activities. International cooperation.

CONTENTS

		Page
I.	GENERAL REPORT	1
1.	PROCEDURAL MATTERS	1
1.1	Opening of the Session	1
1.2	Adoption of the Agenda	1
1.3	Date and Place of Eighth Session	1
1.4	Election of Officers for the Forthcoming Period of Activities	1
1.5	Closing of the Session	2
2.	IMPLEMENTATION OF RECOMMENDATIONS OF THE SIXTH SESSION AND OTHER INTER-SESSIONAL ACTIVITIES	2
2.1	General	2
2.2	Application of System Analysis Approach to Research and Management of Aquatic Resources	2
2.3	International Symposium on Pacific Pollock	2
2.4	Manual on Fish Egg and Larval Surveys	3
2.5	Fish Behaviour	3
3.	SCIENCE POLICY ON LIVING AQUATIC RESOURCES AND ENVIRONMENT	3
3.1	Scientific Advice to Fisheries Management and Development Bodies	3
4.	SURVEY AND EVALUATION ON LIVING AQUATIC RESOURCES	4
4.1	FAO World Appraisal of Fishery Resources Programme (WAFR)	4
4.2	Acoustic Research	5
4.3	Marine Mammals	7
4.4	Scientific Evaluation of the State of Stocks in the Southwest Atlantic	7
4.5	Fishery Data	7
4.6	Fishing Effort	8
5.	IMPROVEMENT OF LIVING AQUATIC RESOURCES AND THEIR ENVIRONMENT	9
5.1	Aquaculture	9
5.2	Protection of Fishery Resources from Pollution	10
6.	OCEAN AND RESOURCE VARIABILITY	12
6.1	Long-Term Studies on Ocean Variability and Marine Resources	13
6.2	Joint IOC/FAO Workshop on "El Niño" and Related Peruvian Ecosystem Studies	14
6.3	Other Cooperative Studies	14
7.	PROGRAMME OF WORK AND BUDGET FOR 1974-75 AND MEDIUM-TERM PROGRAMME	14
8.	MATTERS CONCERNING THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC)	15
8.1	Integrated Global Ocean Station System (IGOSS)	15
8.2	Global Investigation of Pollution in the Marine Environment (GIPME)	15
8.3	Training and Education of Marine Scientists and Technicians	16
8.4	Second Joint Oceanographic Assembly (JOA) - Edinburgh, 1976	17
8.5	Cooperative Investigations of the Caribbean and Adjacent Regions (CICAR)	17
9.	INTERNATIONAL COORDINATION AND COOPERATION	18
9.1	Collaboration with SCOR	18

Page

II. APPENDIXES

APPENDIX 1 - AGENDA 19

APPENDIX 2 - LIST OF INFORMATION PAPERS 20

APPENDIX 3 - LIST OF WORKING PAPERS 21

APPENDIX 4 - LIST OF PARTICIPANTS 23

APPENDIX 5 - LIST OF ACMRR WORKING PARTIES 28

APPENDIX 6 - LIST OF ACRONYMS USED IN REPORT 29

APPENDIX 7 - REPORT OF THE 1st SESSION OF THE ACMRR WORKING PARTY ON MARINE MAMMALS 30

I. GENERAL REPORT

1. PROCEDURAL MATTERS

1.1 Opening of the Session

1. The Chairman, Mr. G. Saetersdal, opened the Session and welcomed the members of the Committee, particularly newcomers, and other participants. He noted with appreciation the presence of several Chairmen of ACMRR Working Parties - Drs. S.J. Holt and C.P. Idyll - and of Dr. G.L.Kesteven, and regretted the fact that Drs. Alekseev and Bogdanov and Professor Hempel, the observer from IABO, were unable to attend. The Chairman also expressed regret that Dr. C.E. Lucas, Chairman of the ACMRR Working Party on Scientific Advice to Fishery Management and Development Bodies was unable to participate. On behalf of the Committee he expressed the highest appreciation and gratitude for the guidance provided by Dr. Lucas in the highly complex and difficult task that the Working Party undertook and executed in such a commendable way. The Chairman also welcomed the Secretary of IOC and the representative from WMO.

2. On behalf of the Assistant Director-General (Fisheries) and the FAO Department of Fisheries, Dr. M. Ruivo, Director of the Fishery Resources Division, welcomed the participants. He stated that Mr. F.E. Popper had asked him to express FAO's appreciation for the valuable work the Committee has done in its capacity as an advisory body to the Director-General in the field of marine resources research and environment, and to the Intergovernmental Oceanographic Commission (IOC), on related subjects. Dr. Ruivo attributed these achievements to the guidance provided by highly qualified scientists directly engaged in fishery research in their respective countries who had an understanding of the potentialities and limitations of the role of FAO. He also stressed the importance of the close contacts ACMRR had maintained with the scientific community as a whole and the collaboration of the Committee with other bodies, especially SCOR and FAO regional councils and commissions. He reminded the group that, during the 12 years that ACMRR has been in existence, major changes have taken place in the development and management of world fisheries and in the nature of supporting research and services. A shift occurred during these years from an era of fisheries expansion to the present situation where many important resources are intensively exploited. The rapid growth of fisheries was accompanied by increased use of the oceans by other user groups which complicated the character of fisheries management and expanded the nature of information needed to interpret the multiple use of the world's oceans. The situation has been further complicated by conflicting interests and by the changes of national jurisdiction over ocean space. In this connexion, Dr. Ruivo referred to the discussions which took place at the FAO Technical Conference on Fishery Management and Development in Vancouver (February 1973).

3. The Chairman suggested that the Committee should plan its future activities bearing in mind the changed situation of world fisheries and the threats to the aquatic environment.

1.2 Adoption of the Agenda

4. In introducing the Agenda (Appendix 1) the Chairman explained that he intended to organize the discussion into three categories: items that would require agreement by the Committee but could be handled rapidly; items requiring moderate discussion, and items which, because of their importance and complexity, after discussion in the plenary, would be referred to a small Ad hoc Group to further elaborate on the subject and to prepare a report for final review by the Session. The Agenda and timetable were then adopted. Dr. D.L. Alverson agreed to act as Rapporteur.

1.3 Date and Place of Eighth Session

5. The Committee was informed that it is envisaged to hold the Eighth Session at FAO Headquarters (Rome) in 1975, preferably during the first half. It agreed that final decisions as to place and dates should be left to the Chairman in consultation with the Secretary.

1.4 Election of Officers for the Forthcoming Period of Activities

6. The Committee agreed unanimously to the re-election of Mr. G. Saetersdal as Chairman, and Drs. D.L. Alverson and S.Z. Qasim as First and Second Vice-Chairmen for the forthcoming intersessional period and the next Session. On behalf of the three officers re-elected Mr. Saetersdal expressed appreciation for this sign of confidence.

1.5 Closing of the Session

7. In closing the Session the Chairman expressed his appreciation for the active participation of all members, representatives and FAO staff. He encouraged the members to give further thought during the forthcoming period to the role of FAO in promoting resources and related environmental research and to the ways and means for the Committee to advise FAO and IOC in these fields. Dr. H. Kasahara, Director of Programme Coordination of the Department of Fisheries, thanked the Committee for its most valuable advice to the Department and expressed the hope for the continuation of this useful work.

2. IMPLEMENTATION OF RECOMMENDATIONS OF THE SIXTH SESSION AND OTHER INTER-SESSIONAL ACTIVITIES

2.1 General

8. The Committee noted with appreciation that practically all the major recommendations of the Sixth Session have been implemented. The following pending matters, which required further guidance by the Committee, were discussed in some detail.

2.2 Application of System Analysis Approach to Research and Management of Aquatic Resources

9. During its Sixth Session, the Committee recognized that the system analysis techniques were applicable to a wide variety of planning activities including fisheries development, management and research. At that time the establishment of a Working Party was suggested to plan for a seminar which would discuss, review and report on the status and the potential application of system analysis to fisheries problems. Action on this recommendation was postponed, due to budgetary restrictions, and also because matters having higher priority required urgent action by ACMRR. Although it was agreed that the views regarding the importance of system analysis expressed at the Sixth Session were still valid, it was decided that a Working Party would not be required at this stage. It was noted that system analysis is currently a tool which is widely used in various national laboratories and institutions and its utility is well documented in the literature. Furthermore, the research aspects of fisheries form only a small part of the overall application of system analysis applied to fishery development and management problems. In view of this, the Committee recommended that one or two specialists should be requested to prepare a review of the methods and techniques of system studies, and their use in fisheries investigations. This review should provide historical examples to illustrate how the system analysis can be of benefit to fisheries researchers and managers. Special attention should be given to the objectives and size of the system, as well as the sensitivity to certain data inputs and accuracy needed. The Committee decided to invite Dr. B.J. Rothschild and Dr. H. Regier to collaborate on this subject.

2.3 International Symposium on Pacific Pollock

10. The Committee was informed of the plans to hold an International Symposium on Pacific Pollock, organized by the Northwest and Southwest Fisheries Centers of the U.S. National Marine Fisheries Service with support from FAO through ACMRR. It noted that this Symposium was expected to take place in Honolulu, Hawaii (U.S.A.) in September 1973 but that it had to be postponed as there were indications that the actual participation, mainly due to lack of travel funds for attendance of Japanese scientists, would not be sufficient to guarantee a successful meeting.

11. The Committee agreed that in view of the importance and rapid increase of the pollock fishery in the North Pacific (mainly by Japan and the U.S.S.R.) combined with changes in the structure of the fisheries and the resources, it was highly desirable to hold such a Symposium as soon as possible. The objective of the Symposium would be to bring scientists of the countries concerned together to discuss the scientific aspects of the pollock resources in the whole North Pacific area, the status of the stocks and of the related fisheries, and the future data and research requirements. The Committee was informed that bilateral consultations between Japan and the U.S.A. are expected to be held soon which, inter alia, may provide advice and information helpful in future plans for the Symposium. The Committee suggested that the Chairman should approach directors of research organizations in the countries concerned to make them aware of the urgency for international discussions and collaboration on the scientific and technical aspects of pollock research.

12. The Committee was advised that an informal exchange of ideas concerning the needs and possibilities of establishing a body for cooperation among governmental and academic institutions on marine and fisheries research in the North Pacific area took place in February 1973

in connection with the Technical Conference on Fishery Management and Development in Vancouver. It was further understood that the Government of Canada had approached interested countries to convene a consultation on this subject. In view of the importance of fisheries in the North Pacific area and the magnitude of marine research effort involved, and recognizing the current lack of an appropriate scientific organization to facilitate information exchange and cooperative research, the Committee encouraged further negotiations in this respect. The Chairman was therefore asked to convey the Committee's view to the governments concerned.

2.4 Manual on Fish Egg and Larval Surveys

13. Based on the activities of the ACMRR Working Party on Fish Egg and Larval Surveys, FAO issued in July 1973 a document entitled "Fish Egg and Larval Surveys (Contribution to a Manual)" (FAO Fish.Tech.Pap.,(122)). The document contains contributions from members of that Working Party and other specialists and was used as background material for the FAO/ MARMAP International Training Course on Fish Egg and Larval Studies (La Jolla, September 1973). It was considered a good basis for the preparation of a comprehensive illustrated Manual, the final text of which FAO would prepare with the assistance of a competent consultant. The Committee agreed that the Manual, when properly edited, would serve a useful purpose, particularly for training of research workers from developing countries. It recommended also that the introduction to the Manual should include guidance concerning the advantages and limitations of fish egg and larval surveys. In discussing this subject the Committee also advised that it would be desirable to incorporate similar prefatory comments in other manuals published by FAO. It was emphasized that such sections dealing with selection of methodology would serve a very useful purpose.

2.5 Fish Behaviour

14. As a follow-up of the recommendations of the FAO Conference on Fish Behaviour in Relation to Fishing Techniques and Tactics (Bergen, 1967), endorsed by the Fifth Session of ACMRR (1968) the Secretariat invited the Fish Behaviour Team of the Marine Laboratory (Aberdeen) under Mr. B.B. Parrish, to prepare a detailed contents list for a set of guidelines on behavioural research having particular relevance to fisheries problems. After receiving comments from ACMRR members and other experts the list would be revised with the intent of using it to develop a Manual on Fish Behaviour Research. A provisional list of experts to whom this document might be sent for comments had been prepared. The Committee agreed that such a manual was within the scope of documents issued by FAO and would be helpful to fishery scientists engaged in the planning of fish behaviour research influencing fishing processes and particularly for research workers in developing countries initiating studies in this field and not having convenient access to the relevant literature. It was also agreed that, in addition to the subject matter described in the draft outline, the document should contain an introductory chapter dealing with the importance and use of various types of fish behaviour studies for providing information useful for the development and management of fisheries resources. The main content of the Manual would follow the outline but with greater emphasis on the importance of studying schooling behaviour and its value as a scientific input to improve fishing techniques and tactics. The inclusion of a comprehensive reference bibliography was essential.

15. The Committee accordingly agreed that the Secretariat invite the Directorate of the Marine Laboratory, Aberdeen, to proceed with the development of the contents list on the basis of these comments as part of the preparations for the Manual.

3. SCIENCE POLICY ON LIVING AQUATIC RESOURCES AND ENVIRONMENT

3.1 Scientific Advice to Fisheries Management and Development Bodies

16. In introducing this Item, the Chairman reviewed the activities and progress achieved during the inter-sessional period. He informed the Committee that the Working Party on Scientific Advice to Fishery Management and Development Bodies met in Rome in November 1972 and an Interim Report was prepared on that occasion (ACMRR: 7/73/WP.7). A summary of the outcome of this meeting was distributed as a Progress Report prepared by the Chairman of the Working Party:

(i) informally to some participants at the FAO Conference on Fishery Management and Development (Vancouver, 1973); and

(ii) formally at the Eighth Session of COFI (1973) which used it as a basis for its deliberations on support to fisheries bodies, data requirements and other pertinent matters.

17. The Committee noted with satisfaction the progress made since the Sixth Session and expressed its deep appreciation and thanks to Dr. C.E. Lucas, the Chairman of the Working Party.

18. When discussing the Interim Report, the Committee again emphasized that ensuring timely supply of appropriate advice was made increasingly important by the intensification and diversification of the use of the marine resources, as well as by the changes occurring, or likely to occur, in the ocean regime. It recognized that the Working Party, due to limitations of the time available for its deliberations, had not been able to cover the whole range of its terms of reference and therefore decided that the Interim Report should not be published as such. Although it had analysed the needs for advice and the deficiencies and problems of current arrangements, and had thus laid the foundations for the study the Advisory Committee had envisaged, it had not yet looked at the implications of its analysis either for the structures and procedures of advisory arrangements of international bodies, or for the scope, pace and coordination of the research which those bodies must promote. However, it is essential that an appropriate document on this subject be available promptly, and accordingly the Committee prepared a paper entitled "The Scientific Advisory Function in International Fishery Management and Development Bodies" (Supplement to this Report) for immediate submission to the Director-General of FAO and prompt distribution. This paper draws very extensively on the Interim Report of the Working Party. The distribution should include delegates to UNCLOS, to COFI, and to the various fishery bodies.

19. Recognizing that the problems for ensuring timely provision of scientific advice for fisheries development and management purposes differ from area to area, the Committee suggested that regional fisheries bodies should interpret and use the document according to their specific situation. Hence, a covering letter for distribution to fishery administrators and scientists concerned should clearly describe the purpose and scope of the document.

20. The Committee agreed that there remain important items in the Working Party's original terms of reference requiring further evaluation and study, especially the arrangements and procedures for supplying scientific advice, and the adequacy of the research and scientific assessment methods on which the advice is based. It accordingly recommended that it is desirable for a Working Party to continue studies on these aspects of the original task, as embodied in item (c) of the original terms of reference. The Chairman and Officers of ACMRR, together with the Secretary, should reconsider the terms of reference of this Working Party and reconstitute its membership as necessary.

21. A number of studies to be carried out on the recommendation of the Committee on other topics considered during the present Session will have a bearing on further work on scientific advice and should therefore be available to the Working Party members, who in the meantime, should continue the exploration of the subject by correspondence.

4. SURVEY AND EVALUATION OF LIVING AQUATIC RESOURCES

4.1 FAO World Appraisal of Fishery Resources Programme (WAFR)

22. The Committee noted that this major FAO programme which developed out of preparations for the fishery sections of the Perspective Study of World Agricultural Development (PSWAD), continues to discharge a long-standing responsibility of FAO. It also noted the scientific advisory importance of such work and its relation to certain regional fishery activities, as well as the current consultations with UNEP concerning monitoring and "Earthwatch" of which WAFR is an important sectoral component. It concluded that a system for a continuing updating of the extremely valuable volume Fish Resources of the World" should have a very high priority in the programme of the Department of Fisheries.

23. The suggestion that this activity should focus on the periodic publication of revised versions of, or supplements to, that book was endorsed. The Committee also recognized that it would be desirable to have other periodic outputs, such as ad hoc appraisals of particular resources, and the publication of a revised global picture of the state of the wild or cultured living resources, by the end of 1975, which would facilitate formulation of broad advice on the contribution to be expected from the ocean and inland waters to future food supplies and related predictive studies.

24. The Committee suggested that the Fishery Resources Division should examine the advantages and disadvantages of preparing either a completely new book or supplements to the original, to be issued in some "loose-leaf" form to facilitate the issuance of subsequent revisions.

Much new knowledge about some resources and areas has come to hand since the original document was issued, and recent events in some important fisheries call for appraisal of their resource base. This knowledge does not come in an orderly fashion, and a system must therefore be devised to summarize it from time to time, and make it generally available in appropriate form within the context of the World Appraisal.

25. Steps should also be taken to compile, analyze, store and retrieve relevant information on man-made changes in the environment, and to evaluate their effects on the resources, using as a baseline the information currently available on the state of the resources and on effects of fishing.

26. In this programme FAO should draw assistance from other ocean-oriented bodies, and many individual scientists. Most of these will surely freely give their assistance, but funds will be needed, as before, to bring groups of them together from time to time, or to facilitate consultations between staff and particular experts. It will be equally essential that FAO staff members substantively contribute to and coordinate this activity.

27. The Committee recommended further that FAO should continue to try to bring together what is becoming known about so-called "unconventional" resources. Attention should also be given to the methodology of resource appraisal - particularly to comparisons of results obtained from various methods - and to the range of parameters needed to describe usefully the status of each resource or stock. Thus, while present catches, current trends, and approximate average maximum sustainable yields remain essential measures, a few others should perhaps be added (e.g., variability of catches and sustainable yields, responsiveness of stocks to changes in fishing intensity from current level of sustainable yield, replacement yield or net population growth rate; relative fishing effort needed for maximum yields or for a specified large proportion thereof. These measures are not all independent of each other, and they sometimes make different demands on the basic data.

28. The feasibility of other outputs needs further testing and a list of possible alternatives should be prepared by the Secretariat.

29. Finally, the Committee emphasized the importance of the FAO Fishery Data Centre, in being potentially both a source of summarized and partially evaluated data, and a possible repository for the various elements of the World Appraisal as they are brought to a definitive stage. The Committee felt that the main function of the Data Centre, when it is fully operative, would, as far as the WAFR is concerned, be to facilitate access to information about the status of exploited fish stocks and to the results of exploration of as yet unexploited or lightly exploited stocks. The latter will essentially be an inventory function rather than one of data compilation. Important inputs are also required from the Aquatic Sciences and Fisheries Information System (ASFIS), maintained by the Fishery Resources Division, which should provide, on a selective basis, relevant published information. In addition, the World Appraisal will need to draw heavily on the present system for compiling catch statistics and on the facilities of the Department for gathering data on fishing effort, both of which are handled by the Fishery Statistics and Economic Data Branch.

4.2 Acoustic Research

30. The Secretariat presented a report on FAO activities in the field of acoustic research and application to fish abundance and distribution. Since the first ACMRR Working Party on Direct and Speedier Estimation of Fish Abundance (1964) the Organization's activities in this field have continued to expand to include: production of manuals on acoustic methods, holding of regional training centres and the application of acoustic assessment methods in FAO/UNDP field projects. Encouraging results were noted for FAO/UNDP projects, e.g. in West Africa, India, Peru and Turkey. A review was given on the proposed plan, under the FAO Government Cooperative Programme with NORAD for the establishment of a Regional Centre in Peru. As background for the discussion, some of the highlights of the recent ICES/FAO/ICNAF Symposium on Acoustic Methods in Fisheries Research (Bergen, 1973) were mentioned.

31. A progress report on the work of the FAO/ACMRR Ad Hoc Group of Experts on the Facilitation of Acoustic Research in Fisheries, established at the Sixth Session of ACMRR, was presented by its Chairman, Mr. Parrish. This included a survey of the extent and status of current research on the use of acoustic methods for fish abundance estimation on a global scale and a report on an informal meeting of the Ad Hoc Group held in connexion with the Bergen Symposium. The Committee discussed the future of the Report on Current Research and recommended that it be published by FAO as either a Fisheries Circular or a Supplement to the Report of this Session. This would be decided later

by the Secretariat. It was also recognized that, in view of the current rapid growth in the application of these techniques, an updating of the review within the next two or three years would be required. This, plus other information available to members of the Ad Hoc Group, could provide the basis for the preparation, on a recurrent basis, of a "synopsis" or review on the state of the art, completed by a selection of the most important bibliographic references on the subject. This would provide an important information flow to both developed and developing countries.

32. The Committee agreed that, at this stage, the Ad Hoc Group should continue its work mainly by correspondence, with special reference to aspects of the subject requiring further study:

(i) methods of handling and processing of acoustic data;

(ii) calibration techniques;

(iii) target strength measurement and analysis;

(iv) survey design and strategy.

33. It was felt that certain aspects could not be adequately treated by correspondence and that meetings, possibly of selected members, might be necessary.

34. The Committee also recommended that the Ad Hoc Group maintain close contact with the proposed Working Party on Measurement of Fishing Effort, in order to identify areas and possibilities for cooperation and to coordinate activities.

35. It was noted that the Ad Hoc Group had also recommended an advanced Seminar in Acoustic Methods similar to the joint FAO/ICES Seminar held in Svolvaer, Norway, in 1969, to be held in the next 3 to 5 years in order that experts engaged in this type of work could be assisted in keeping abreast of current advances and improvements in technology. It was advised that ICES will be considering this problem further during its 1974 Statutory Meeting.

36. The Committee considered implementation of an international acoustic exercise as proposed by ACMRR's Ad Hoc Group during the Bergen Acoustic Symposium. It was noted that the objectives of such exercises should be to compare acoustic equipment and calibration techniques used by various nations and to make comparisons of independent estimates of abundance and distribution indices generated by such studies. The Committee agreed on the desirability of conducting international acoustic exercises and felt that they would promote a better understanding of the utility and limitation of acoustic techniques for enumerating fisheries resources and could lead to the evolution of more effective reliable acoustic surveys.

37. It was recognized that such joint activities are already being planned for the North Atlantic and have in the past been attempted in the Northeast Pacific. The importance of planning in the conduct of joint exercises and the desirability of carrying out studies on both demersal and pelagic resources, when feasible, was stressed.

38. The Committee proposed that international acoustic studies should be encouraged in the following areas and on the noted species groups:

(i) Northeast Atlantic - blue whiting;

(ii) Baltic - cod and clupeoids;

(iii) West Coast of Mexico and U.S.A. - anchovy and hakes;

(iv) West Coast of Peru - anchoveta;

(v) Southwest Atlantic - hakes and clupeoids.

39. It was noted that, if nationals were to participate in an international acoustic exercise at great distance from home ports, it would be desirable to associate such exercises with broader scientific objectives, e.g., to ascertain geographical distribution and abundance of specified resources using acoustic techniques and increase the understanding of the mechanisms responsible for observed distribution and abundance patterns associated with observed environmental parameters.

40. The Committee felt that FAO could best facilitate such exercises through: (i) assisting in information exchange and joint planning activities (when feasible); (ii) contacts made by the Secretariat to solicit the response of host coastal nations to such endeavours; and (iii) contacts to determine the interest of nations who may wish to participate. It was recommended that the plans and results of such studies should be reported to the ACMRR Ad hoc Group of Experts to keep it informed of progress in this field.

4.3 Marine Mammals

41. The Committee examined the report of the First Session of its Working Party on Marine Mammals (see Appendix 7). It noted that a good start had been made with its complex task and approved the planned activities. In that connexion, it recognized the need for paying careful attention to the organization of the work, and endorsed the arrangements being made for cooperation with other organizations as well as for enlisting the assistance of individual scientists. The proposed timetable for the activities of the Working Party, including the convening of a world scientific meeting of experts in 1975 (Conference or Symposium, under the sponsorship of FAO, with collaboration of other interested bodies, e.g. IWC, IUCN), was endorsed. The main task of this meeting would be to review the report of the ACMRR Working Party in the light of observations received from scientists around the world to whom it will be sent, supplemented, if necessary, by a small number of invited studies. There is still a need actively to pursue outside funding for this activity, which is of considerable interest to various governments and organizations, UNEP among others. It was suggested, too, that members of the Committee might individually seek to promote financial and other forms of support by their own countries, both directly and indirectly.

42. Members offered a number of suggestions for specific actions such as review of what is known about pesticides and other contaminants in the organs of marine mammals and effects on their biology; the Committee also recommended the preparation of FAO Species Synopses prior to the proposed world scientific meeting.

43. Several members of the Committee emphasized the importance and, at the same time, the difficulty of the task set to the Working Party's Ad Hoc Group IV in evaluating the ecological relationships of the mammals with other biota, including other exploited or potential resources. Although data pertinent to such a study are far from adequate, there exist many elements of such information, and the proposed world scientific meeting of experts could be an important forum for their evaluation and discussion. The results, even partial, to be expected from Ad hoc Group IV consultations should be of no less interest to COFI than the reviews of conventional assessments of exploited stocks of whales and seals.

4.4 Scientific Evaluation of the State of Stocks in the Southwest Atlantic

44. The Secretariat introduced the final draft (July 1973) of the Report of the First Session of the ACMRR/CARPAS Working Party on the Scientific Evaluation of the State of the Stocks in the Southwest Atlantic (Montevideo, 1971). The report indicates the existence of large fish resources south of 33°S latitude which are at present only lightly exploited. However, the lack of data has not yet allowed detailed evaluation of the coastal stocks, or the northern stocks. The Working Party recommended that a second session be held before the next CARPAS meeting (mid 1974), should new information become available. In this connexion Brazil, with the assistance of the UNDP/FAO Fishery Research and Development Project and FAO, is organizing a workshop for the evaluation of their fisheries.

45. The Committee noted with appreciation the recent progress made in the evaluation of the fisheries resources in this area. It accepted the report of the Working Party and agreed that there was a definite need for a second session of the group. Furthermore the Committee requested that the Secretariat should support its work by keeping contact with non-CARPAS countries fishing or having data in the area to ensure the provision of information needed for further stock evaluation studies and to facilitate their possible participation in the session of the Working Party.

4.5 Fishery Data

46. The Committee was informed on steps taken to implement ACMRR and COFI Recommendations concerning FAO's improvement in the field of production, compilation, exchange and dissemination of fishery data, and to ensure that the various existing units (e.g., FAO Fishery Data Centre, Fishery Statistics and Economic Data Branch) supplement and appropriately interact with each other so as to increase efficiency. It noted with satisfaction the

establishment within the Department of Fisheries of an Inter-Divisional Working Group on Fishery Data which would identify the nature and quality of data required by FAO and consider other methods of improving data retrieval and dissemination. The Committee stated that identifying the fishery data requirements of a biological, economic, and technological nature through the Inter-Divisional Working Group seemed a flexible and efficient internal mechanism. In reviewing a preliminary check list of fishery data required for research and specifically for stock assessment studies, the Committee felt that the views of data users outside FAO should be sought so as to provide an objective guide to the Department in pursuing this exercise.

47. The Working Party on Scientific Advice to Fishery Management and Development Bodies (see Section 3.1) had also addressed themselves to the fundamental problems related to the advances of the basic data, and of methods used for fishery resource evaluations. Their considerations of this topic were reviewed and accepted by the Committee, which recommended that the conclusions concerning general shortcomings, basic requirements and suggestions for solution should be the subject of a communication from the Chairman and Secretary of ACMRR to all fishery research and management bodies as soon as possible.

48. The Secretariat informed the Committee that they would be kept abreast of further progress and comments of members on data priorities would be solicited through correspondence.

49. A discussion was held on the Fishery Data Centre and its potential as a component of the World Ocean Data Centre System for making inventories and keeping archives of fishery data from selected areas, especially those not covered by national or regional centres. However, the present budget and staff available to the Centre has forced FAO to move slowly; nevertheless, efforts to develop data analysis systems of FAO/UNDP field projects, and to establish or improve national systems for the collection of effort and biological data for use by regional fisheries bodies, have been encouraging. The Committee felt that the FAO Fishery Data Centre should continue to concentrate its resources on servicing the programme for World Appraisal of Fishery Resources, field projects and FAO regional fisheries bodies with no data processing facilities, until such time as more substantial resources are available to bring it up to the level of operation required by member governments as a whole.

50. The Committee was also informed of the progress made in planning for services related to data on contaminants in aquatic organisms (marine and freshwater). Such services could be essential for in-house activities, as well as to governments, scientists and various national and international bodies involved in research, monitoring, assessment and management of living aquatic resources and environment. It was emphasized that such services are essential for the preparation of sectoral aspects of the proposed recurrent study on "State of Health of the Ocean" recommended by the UN Conference on the Human Environment. The Committee was informed that a proposal requesting support from UNEP to strengthen this sector of the Data Centre activities, which fill a serious gap in international services, was submitted by FAO.

4.6 Fishing Effort

51. The Committee considered the growing difficulties resulting from the evident limitations inherent in the use of fishing effort and catch per unit effort as measures of fishing mortality and stock abundance. It was also noted that, notwithstanding their obvious limitations, effort statistics remain one of the most useful tools available for assessing the stocks as well as - although under different forms - basic data for estimating the economical inputs to fisheries. The Committee recognized the urgent need to assess the possibility of reducing some of the present constraints by: (i) improving the methods of collecting, compiling and analysing fishing effort statistics; and (ii) evaluating alternative, independent methodologies (e.g., age determination/cohort analysis, acoustic surveys, tagging, etc.).

52. The Committee therefore decided to set up a Working Party on Fishing Effort and Monitoring of Fish Stock Abundance under the chairmanship of Mr. B.B. Parrish and recommended that the terms of reference of this Working Party should be as follows:

(i) to identify, by reference to recent specific fishery situations, changes in fishing practices and techniques or in fish abundance or distribution of fish or fishing that can make the catch per unit effort a biased estimator of changes in abundance, and to propose units of effort, and additional information that can reduce this bias;

(ii) to review all methods of regularly monitoring changes in the abundance of commercial fish stocks, and in particular to compare in a general way the relative costs, precision, and risk of bias of different methods. Note should also be taken of the additional information that may be provided by the monitoring procedure, e.g., on size composition, detailed distribution, abundance of pre-recruits, etc.

5. IMPROVEMENT OF LIVING AQUATIC RESOURCES AND THEIR ENVIRONMENT

5.1 Aquaculture

53. The Committee considered and approved the Report of the First Session of the ACMRR/IABO Working Party on Aquaculture, held in Rome, 17-23 May 1972. The research problems identified by the group were accepted as of high priority for aquaculture development. The Committee noted that FAO has continued to promote research on the aspects directly related to aquaculture practices, and these are expected to contribute substantially to the cooperative research programmes organized through FAO regional fishery bodies. The Committee was also informed that those research aspects which are of a broad basic ecological nature recommended for inclusion in LEPOR have already been communicated to the IOC, and that efforts will be made by the Commission to promote such studies through CICAR and CSK.

54. In discussing the need for more effective research and development activities, and the Working Party's observations relating to FAO's role in promoting these, the Committee considered the efforts being made by the Department of Fisheries to obtain the necessary support and funding from different sources.

55. The Committee noted the interest expressed by the Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAR) in aquaculture research and the recommendations made by a Working Group convened by TAC in Spoleto, Italy, in July 1973. It is hoped that this will lead to the sponsoring of regional networks of research centres by CGIAR in the developing regions. Meanwhile, FAO is seeking UNDP support to assist the cooperative research programmes underway in the GFCM, IPFC and EIFAC regions. UNDP support is also being sought for assisting developing countries in the formulation of aquaculture development projects and for organizing regional training courses and related activities.

56. The advantages and problems associated with regional research institutions were discussed in some detail. It was agreed that a network of national centres linked to a regional centre can be very valuable, but the regions will have to be chosen with due reference to ecological characteristics and existing aquaculture systems, rather than political boundaries. The Committee expressed the hope that well coordinated regional research programmes will be established in a phased manner.

57. Very strong support was expressed for the technical information service provided by the FAO Fishery Resources Division so far, through the issuance of several documents and periodicals, particularly the FAO Aquaculture Bulletin and the proceedings of symposia. In view of the unique needs of aquaculture development, it was felt that there is a need for strengthening the research information service activities in this field.

58. The Committee reviewed the objectives and organization of the Technical Conference on Aquaculture scheduled to be held in 1975 and agreed that the revised outline prepared by the Secretariat could provide the basis for a detailed prospectus. It was informed that due to budgetary restrictions the actual dates of the Conference have not yet been decided. Considerable concern was expressed about the possible postponement of the Conference. It was suggested that, if it becomes impossible to hold the Conference during the next biennium, adequate provision should be made for it to be held in 1976.

59. The Committee considered the future role of the ACMRR/IABO Working Party on Aquaculture and agreed that it should continue with the following terms of reference:

(i) in cooperation with the FAO regional bodies concerned to review the results achieved by cooperative research programmes on aquaculture and to assist in the pooling of experience and exchange of information;

(ii) to consider ways and means for better utilization of the facilities of academic institutions for ecological and physiological studies related to aquaculture;

(iii) to assist ACMRR in preparing a world inventory of existing and potential aquaculture sites, with realistic projections of possible increases in fish and shellfish production through farming;

(iv) to review the present status of introductions of non-indigenous species for aquaculture and transplantations and develop suitable guidelines for future work in this field, including the procedures to be adopted for determining the need and testing the results of such activities;

(v) along with other experts, to assist FAO in the planning and organization of the proposed FAO Technical Conference on Aquaculture; and

(vi) to continue to assist in providing guidance for scientific programmes on basic research relevant to the aquaculture aspects of LEPOR and related activities under IOC.

The membership should be revised as necessary to fulfil its new functions.

5.2 Protection of Fishery Resources from Pollution

60. The Secretariat reported on recent FAO activities which, in accordance with guidance provided by ACMRR and the Committee on Fisheries, are focused on the study of the effects of pollution on living aquatic resources and fisheries, and on actions required to protect these resources from this threat. Particular reference was made to the services maintained by the Fishery Resources Division for exchange and dissemination of relevant information through publication of subject reviews, and through various outputs of the FAO Aquatic Sciences and Fisheries Information System (ASFIS).

61. The Committee also noted that FAO is receiving an increasing number of requests from member countries for technical advice and assistance either directly or through some of the existing FAO/UNDP fisheries projects, and that preparatory missions and negotiations are under way to establish regional laboratories for which funding from multi- or bilateral sources is under discussion.

62. The Committee considered these activities of great importance to fishery management and development and encouraged FAO to progressively improve, as required, its programmes in this field and to continue to cooperate with other international organizations, particularly with IOC (see Item 8).

63. The Committee reviewed the plans, which were at a more or less advanced stage, for the establishment of three Working Parties[1] dealing with different aspects of the effects of pollution on living aquatic resources:

(a) ACMRR/IABO Working Party on Ecological Indices

The Committee endorsed the following terms of reference for this group:

For purposes of measuring, surveying and monitoring the impact of pollution, nutrient enrichment, modification of water flow, and similar technological stresses on living aquatic resources:

(i) to bring together for critical review such indices as have already been proposed;

(ii) to propose guidelines for the selection and/or formulation of well-balanced sets of indices;

1/ It was further noted that the Secretariat had already had consultations with the President of IABO concerning the two groups to be formed jointly with the Association, and that requests for funding of the activities of the three Working Parties had been submitted by FAO to UNEP so that first sessions of the groups could be envisaged for 1974.

(iii) to propose new indices for further research and testing;

(iv) to evaluate the usefulness of such indices as measured, say, by the relative cost of the practical information that they provide; and

(v) to develop guidelines for pilot studies and research projects to be incorporated into on-going activities of FAO and other bodies as well as relevant programmes such as GIPME.

64. The Committee agreed that the ecological indices to be considered should relate to the following levels of organization in marine and freshwater systems: population, community, ecosystem, with special emphasis on community indices. Bio-assay and toxicity tests, aiming at the organism and population levels should be excluded here as should also the complex functions which might derive from extended and intensive analysis of functional dynamic models. Emphasis should be placed on sets of indices which together are adequate to discriminate among the effects of various natural factors, technological stresses, and fisheries exploitation.

65. It was noted that Dr. H. Regier accepted responsibility as Chairman of this Working Party, and the Committee provided guidance to the Secretariat concerning the proposed membership.

(b) ACMRR/IABO Working Party on Biological Effects of Pollutants

66. Concerning this group which is expected to review and evaluate critically the methods for bio-assays and toxicity tests presently used, the Committee agreed upon the following terms of reference, developed jointly with IABO:

As a basis for decision-making on management of the aquatic environment and specifically on the regulation of waste disposal, with the aim of protecting the living resources and fisheries and establishing selected monitoring programmes:

(i) to review the present use of methods of bio-evaluation, including toxicity tests to measure short and long-term effects of pollution on selected aquatic species;

(ii) to evaluate critically the methods used in bio-assay and toxicity tests to assess their accuracy and reliability with special regard to methods of obtaining test organisms, and to advise on their value for control and research purposes and for general use in environmentally different geographic areas;

(iii) to select working methods and to prepare detailed proposals for their intercalibration and eventual standardization with regard to mortality and survival rates, chronic and sub-lethal effects on biological processes and activities (e.g., growth, behaviour, reproduction, etc.) of various species and for various pollutants, taking into account also bio-accumulation processes and the problems of joint toxicity;

(iv) to advise on the practical use of tests to improve the use of data from laboratory tests, field experiments and field observations, including the possible use of organisms and tissues under culture;

(v) to identify research programmes required to improve methodology and their application to the establishment of criteria and standards (e.g., water quality, tolerance limits, etc.).

67. The Committee agreed further that Dr. J.B. Sprague, Canada, should be invited to act as Chairman for this group. It also provided suggestions for potential members and decided to leave the further arrangements to the Secretariat, in consultation with the Chairmen of ACMRR and the Working Party.

(c) ACMRR Working Party on Biological Accumulators

68. For this group the Committee elaborated and adopted the following terms of reference:

As a basis for using bio-accumulators in monitoring programmes to detect contaminants in the marine environment, especially at low level concentrations, taking into consideration both the methods based on the sampling of natural populations and the development of standardized, even clonal, organisms:

(i) to review on-going research and operational programmes, and present knowledge in the field of biological accumulation of contaminants;

(ii) to evaluate bio-accumulator species presently used for detection of pollutants and to advise on other organisms suitable for standardized use in monitoring programmes;

(iii) to recommend standardized working methods with emphasis on sampling and analytical techniques and experimental procedures;

(iv) to advise on laboratory and field studies aimed at calibrating the accumulation capacity of selected species, to be used as a sensitive tool for measuring low concentrations of pollutants;

(v) to develop guidelines for pilot studies aimed at introducing bio-accumulation methods into monitoring programmes.

69. The Committee recommended that Dr. J. Portmann (Burnham-on-Crouch, U.K.) should be invited to act as Chairman of this group. Rather than prepare a tentative list of participants it was decided to list the fields of experience to be covered by the Working Party:

variability and sampling; metabolism of organic contaminants; physical chemistry; analytical chemistry; vertebrate biology; biological oceanography (primary and secondary production); benthos ecology.

The Committee decided to leave the selection of members of this Working Party to the discretion of the Chairman and the Secretariat, in consultation with the proposed Chairman of the Working Party.

6. OCEAN AND RESOURCE VARIABILITY

70. On the basis of ideas expressed during an exchange of correspondence between specialists in this field, including members of ACMRR, and which originated from a letter by Dr. J.A. Gulland to Dr. B.J. Rothschild, the Committee discussed the overall aspects of the relation between fisheries research and environmental studies. Consideration was given to a proposal to publish the set of letters exchanged but it was felt that the correspondence did not provide a full review of the whole spectrum of related questions. The Committee realized that this was a problem which had been discussed on many occasions in the past but because of its importance was a relevant topic for further consideration by ACMRR. It was a general consensus that the letters should not be published, and that the Chairman should so advise the originators and other relevant individuals.

71. The Committee concluded that the basic question was not to define priorities between research directly concerned with fish stocks and fisheries on the one side and environmental research on the other, but rather to outline the interactions between the two activities and to provide guidance to FAO and IOC on programmes designed to make environmental studies more effective for fisheries resource assessment, forecasting, and management. The view was expressed that there was no such field as "fisheries oceanography" but only the need for close collaboration on both sides. It was also felt that although budgetary limitations need always to be taken into account, there was no incompatibility between fisheries research in the strict sense and oceanography which is carried out for many reasons other than only fisheries, e.g., for hydrographic services, oil and mineral exploitation in the sea bed, etc.

In general, an increase in oceanographic investigations may but should not detract from funds for research directly concerned with fisheries assessment. A problem could, however, occur in developing countries where short-term priority is associated with activities leading most directly to fisheries development/management and the production of more food. In these cases environmental information may be an important part of the total management advice, and fisheries investigators working in such areas should give due consideration to the environment aspects in planning such studies.

72. During its deliberations the Committee appointed a sessional ad hoc group to consider the implication of fish stock and environment interaction on the research necessary to support management advice. On the basis of its conclusions the Committee recognized that the catch that may advisedly be taken from a stock during a particular time is not a function solely of the stock magnitude and composition, plus innate growth and reproduction potentials but also the relation of these stock characteristics to changing factors of the environment.

73. A review on the kinds of relations between environment and fisheries is needed now as the basis for providing guidance to permit the appropriate balancing of the fishery and environmental elements in the research programmes. The Committee affirmed this need and recommended that FAO take the initiative in arranging for the preparation of such a review, which would be of general value for those concerned with these aspects of research.

74. The Committee felt that there is a strong need for closer collaboration between fisheries scientists and oceanographers with more frequent dialogue and joint planning of integrated inter-disciplinary research programmes. It was suggested that much could be learned from experience in research on inland and estuarine waters. In this connexion the Committee noted with concern that there was an increasing tendency in the administrative set-up in a number of countries to separate fisheries scientists from environmental research workers.

75. For the biological sector the Committee recognized a particular need for an expansion and intensification of studies on fish physiology and behaviour, as well as field laboratory investigations on the early life history of fish under various environmental conditions (e.g., spawning, feeding and survival of larvae, etc.), which are essential for a better understanding of the dynamics of fish populations.

76. The Committee considered certain particular actions (see sections 6.1 to 6.3; some sub-sections under 8) which in its view are necessary steps to be taken now in the direction of promoting a better understanding of the direct and interaction effects of fisheries and environment, and which could lead to more effective management by international and regional bodies.

6.1 Long-term Studies on Ocean Variability and Marine Resources

77. In considering the relation between environmental changes and those in populations of marine organisms the Committee took into account the recommendations of the Joint SCOR/ACMRR/UNESCO/IBP(PM) Working Party on Monitoring in Biological Oceanography (Chairman: Dr. Longhurst) for a review of data from existing biological monitoring programmes in order to determine the background of natural variability and to distinguish it from changes induced by the activities of man. At the same time, it was recognized that provision had been made in the programmes of the Joint Oceanographic Assembly (1976) for symposia in which the results of such a review could be discussed.

78. Accordingly, the Committee decided to establish a Working Party on Biological Effects of Ocean Variability under the chairmanship of Dr. Longhurst with the following terms of reference:

(i) to review data from biological monitoring programmes and those relating to ocean climatological data from the same regions and periods;

(ii) to consider the synthesis of such data and the hypotheses that could be built up to account for the observed interactions;

(iii) to assist in the organization of a Special Symposium for the JOA in which selected case studies of the interactions between environmental changes and those in the distribution and abundance of fish stocks or other marine organisms could be presented.

In consultation with the JOA Steering Committee, proposals could be made for one or two speakers in the proposed General Symposium on Natural Variations in the Marine Environment (5 to 500 years). The support of SCOR and/or IABO in co-sponsoring the Working Party should be sought.

6.2 Joint IOC/FAO Workshop on "El Niño" and Related Peruvian Ecosystem Studies

79. The Committee was informed of proposals under consideration by IOC in consultation with FAO, for carrying out a cooperative investigation of the phenomenon known as "El Niño", under the International Decade of Ocean Exploration (IDOE). Formal requests for such an investigation have been made by the Governments of Chile, Ecuador and Colombia. Peru has verbally stated its interest.

80. Subject to a formal request being announced from Peru, it is planned to convene a joint IOC/FAO Workshop (most likely in Lima, Peru) in mid 1974 which will be asked to prepare recommendations for cooperative action to be taken by the member states of the two bodies. It is envisaged that the action recommended would be directed toward improving the understanding of the cause of the phenomenon, its relationship to regional, oceanic and global environmental processes and also to developing means of prediction of its occurrence with as long a lead time as feasible.

81. The Committee agreed that the Workshop on "El Niño" would serve a useful function in bringing together information on the topic, and FAO's participation in the Workshop was welcomed.

82. In addition, the view was expressed that while monitoring of ocean changes in the Eastern Tropical and South Pacific was an essential element in studying the phenomenon, its elucidation will depend on studies of ocean-wide dimension in addition to observations of local manifestations. Thus, it would be useful for understanding "El Niño" to strengthen the existing relevant IDOE projects such as the NORPAX, by extending their coverage and focus to the tropical and subtropical region, and by broadening participation in them.

83. Arguments were presented that the Peruvian ecosystem is of a simplicity that particularly favours understanding of the interactions between environment and the anchoveta population and that, in view of the present difficulties in the Peruvian anchoveta fishery, an intensive study of the region could be particularly fruitful.

84. It was decided to request Dr. G.L. Kesteven, Project Manager of the FAO/UNDP Fishery Research and Development Project in Peru, together with Peruvian scientists concerned, to explore the desirability and feasibility of developing within the project described above, a cooperative investigation of the interactions between the ocean environment and the anchovy populations on the coasts of Peru and Chile.

6.3 Other Cooperative Studies

85. The attention of the Committee was drawn to the recommendation by the IOC Group of Experts on Long-Term Scientific Policy and Planning (GELTSPAP), for a cooperative study of the subtropical convergence in the Southwestern Atlantic and the views of CARPAS that such a study could provide a better understanding of the oceanographic and biological processes taking place in the coastal zones of the CARPAS Member Countries, and that, consequently, it would be of importance for the fisheries study in this region. It was noted that this proposal would be considered further at the forthcoming session of the IOC Assembly.

86. Reference was also made to the needs for similar studies in the monsoon region of southern Asia, and it was noted in this regard that, based on a proposal from India, IOC was already planning a wide-range monsoon experiment (MONEX) for implementation in 1977. IOC and WMO have been requested to provide data through IGOSS retrospective for the period 1972-77.

7. PROGRAMME OF WORK AND BUDGET FOR 1974-75 AND MEDIUM-TERM PROGRAMME

87. The Committee first considered the recent adverse trends in the budgetary provision for FAO's work in fields of interest of the Committee and for the Organization as a whole. While regretting the thus weakened support for activities which are considered essential to the world fisheries community, it agreed with the main priorities chosen under these circumstances, resulting in a balanced programme of work, and expressed its great appreciation for the spirit with which the staff had met the difficulties and the workload taken on to solve many critical demands.

88. The Report of the Seventh Session will on the whole provide some policy guidelines for future activities, but the Committee wished to identify two specific activities for which increased personnel services should be given priority, viz., World Appraisal of Fishery Resources, and Aquaculture.

89. Notwithstanding present budgetary restrictions, it was felt that an increase in the allocation of funds for contracts, consultants and non-staff travel to allow the necessary freedom and flexibility which would permit optimum usage of staff and facilities of FAO and adequate use of expertise available in national institutions is most desirable.

90. The Committee expressed an interest in also being enabled to review the field programmes relating to resources research with which FAO is associated. In this context it was suggested that special studies of the state of fishery resources research should be undertaken, preferably on a regional basis, by secretariat personnel or consultants, and that the results of such surveys should be made available for the Committee's next session and form the basis for a discussion of research programmes in the field and related policy matters.

8. MATTERS CONCERNING THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC)

8.1 Integrated Global Ocean Station System (IGOSS)

91. The Committee was informed by the Secretariat about the progress which has been made in the further development of IGOSS since the extended discussion on this topic at the Sixth Session of ACMRR.

92. Whilst progress made in the service-oriented sector, i.e., in that part of IGOSS which deals with the immediate use of so-called real-time data for analyses in oceanographic and meteorological services, was appreciated, the Committee nevertheless stressed the special importance of the non-real-time aspects of IGOSS for fisheries research and agreed strongly with the emphasis which was given in the report of the Secretariat to the research-oriented sector of IGOSS. In this respect the Committee discussed the potential benefits of IGOSS to fisheries, having in mind the discussions already held on Ocean and Resource Variability (Section 6 of this Report).

93. The descriptions of the changing environment expected from IGOSS activities could contribute to studies of the relations between the environment and the distribution and abundance of marine living resources, in addition to services to fishing operations. At the same time the fishing fleet could prove increasingly useful in providing platforms for observations to improve IGOSS data acquisition on ocean conditions in certain areas.

94. Recognition of these mutual benefits had lead COFI at its Eighth Session to propose more formal participation of FAO in the establishment of IGOSS. However this may develop, the requirement of FAO for advice in this area would certainly increase. Because of the need for the Secretariat to get technical advice, the Committee decided that its officers and some selected members should continue to oversee IGOSS activities related to fisheries and provide guidance to FAO for its participation in the further development of the system.

95. Some of the IGOSS-like services available today are provided by fishery institutions. The products of these services will presumably be included in the compilation of IGOSS services being prepared by IOC but much more requires to be known about their working procedures, information and data requirements, and uses made of them by fishery and other interests. The Committee proposed that an evaluation of these synoptic fishery descriptions and forecasting services be undertaken by the Secretariat, possibly with the assistance of a consultant, and under the guidance of the officers and selected members mentioned above.

8.2 Global Investigation of Pollution in the Marine Environment (GIPME)

96. The Secretariat reported on the progress in the preparation of the GIPME programme which is one of the major elements of the Long-Term and Expanded Programme of Oceanic Exploration and Research (LEPOR) being coordinated by IOC as a joint specialized mechanism of the organizations members of ICSPRO. GIPME is expected to form the basis for international cooperation in the field of scientific research concerned with marine pollution, its effects, and related services. It was noted that the IOC established an International

Coordination Group (ICG) for GIPME which had the task of preparing a Comprehensive Plan for the Implementation of GIPME, and that advice on specialized scientific problems was provided by the Joint SCOR(WG.45)/ACMRR/ACOMR/ECOR/ICES Working Group on Marine Pollution Research.

97. The Committee was informed that IOC took action to initiate preparation of a Draft Comprehensive Plan with the help of a consultant. The main elements of this Plan will be concerned with (i) pollution pathways (in both directions) between land and sea, sea and air, sea and sediments, sea and biota and with dispersion and transport; (ii) methodology and intercalibration; (iii) data and data exchange; (iv) training and education; (v) dynamics of aquatic ecosystems in relation to pollution; (vi) research needs for monitoring biological effects; and (vii) role of documentation services.

98. In view of the importance of this first Draft Comprehensive Plan for GIPME the Committee considered it essential that the Plan should be made available as soon as possible to the scientific advisory bodies of the Commission so that it could be circulated to selected members and chairmen of subsidiary bodies dealing with pollution matters. After receiving their views, the Joint Working Group on Marine Pollution Research would prepare a consolidated comment for submission to the Second Session of the ICG for GIPME (15-19 July 1974). As it is clearly impossible to begin a study of the Draft before the middle of November, it was suggested that IOC postpone the deadline for final comments for at least one month. The Committee was further of the opinion that the meeting envisaged for the Joint Working Group at Lowestoft, from 19 to 20 November 1973, if maintained, could only provide opportunity for an informal preparatory exchange of views on the Draft Plan. The Secretary of IOC confirmed that also after GIPME-II ample opportunity will be given to all interested groups and specialists to further study and comment on the Draft Comprehensive Plan.

99. The Secretariat reported also on the action being taken by IOC to prepare a review on what was called the "State of Health of the Ocean" which would consist mainly of reports on the sources, distribution and movement of the major pollutants in the marine environment and organisms, based on evaluation of data from baseline studies and monitoring programmes. The Committee noted that IOC has appointed a consultant to prepare such a preliminary study which is expected to be circulated to experts and groups for comments before publication. The Committee suggested that IOC should be asked to submit this report to appropriate bodies and to either incorporate their comments into the report or to attach these comments in an annex to the report.

8.3 Training and Education of Marine Scientists and Technicians

100. During its Sixth Session, the Committee recognized the discrepancy between expected future needs for marine (including fisheries) scientists and technicians, and the apparent failure of international efforts to promote training and education at the level required. The Committee hence urged FAO and Unesco to seek to increase their funds for training and education in marine science from all possible sources, including bi/multilateral funds. The Committee noted in this regard that FAO had successfully secured funds through Government Cooperative Programmes (supplementing the Regular Programme) to organize courses and seminars and to prepare manuals and identification (taxonomic) sheets for fishery purposes. The Committee was also informed that similar extra-budgetary funds are expected to continue to be made available for these purposes during the forthcoming biennium.

101. The IOC Working Group on Training, Education and Mutual Assistance (TEMA), in which ACMRR participated through a nominee (Mr. O. Østvedt), recommended support through the IOC Trust Fund for the preparation of a "Guide to Institutions with Training Facilities in Aquatic Sciences and Fisheries", a "Directory of Marine Scientists", and a "World List of Periodicals in Aquatic Sciences and Fisheries", all of which are outputs from the ASFIS system maintained by the Fishery Resources Dviision. The Committee considered this an appropriate course of action.

102. The need for assessing the training and manpower requirements of various countries in marine science disciplines was stressed. In this context the Committee noted that the subsidiary bodies of FAO and IOC, as well as the regional bodies of FAO, could be an effective mechanism in assessing scientific and technical manpower requirements of the member countries. Such an assessment could assist in the planning of relevant training programmes which would allow them to effectively deal with national and international

marine research programmes. In that connexion, the Committee strongly recommended that evaluation of training needs - and suggestions on how to meet such needs - should be included within the terms of reference of groups undertaking the planning of any new international cooperative investigations.

103. The Committee felt that partnership arrangements between research and university institutes of developing and developed countries constitute a substantial contribution toward increasing the scientific competence in marine science (including fisheries aspects) in developing countries and should therefore be encouraged.

104. The Committee decided to maintain its participation in the IOC Working Group on Training, Education and Mutual Assistance through continuing the present arrangements with ACMRR nominees to be designated by the Chairman in consultation with the Secretary.

8.4 Second Joint Oceanographic Assembly (JOA), Edinburgh, 1976

105. Professor W.S. Wooster, Chairman of the Steering Committee for the Assembly, reported on the progress in the preparations for JOA, particularly on aspects of direct interest and implication to FAO and ACMRR.

106. He referred to the proposal for holding during the JOA two symposia with which ACMRR will be concerned. Firstly, it is envisaged to organize a General Symposium on Natural Variations in the Marine Environment (5 to 500 years) for which the Committee could suggest one or two speakers to ensure that the fisheries aspects will be properly covered. Secondly, the Committee had agreed to take full responsibility through a Working Party, to prepare a Special Symposium on Biological Effects of Ocean Variability (see Section 6 of the Report).

107. It was noted that the JOA Logistics Committee was being convened by the IOC Secretary on 1 November to consider obtaining funds from the organizations members of ICSPRO to: (1) bring conveners and invited speakers who could not obtain national funding (estimated at U.S.$ 60 000), and (2) bring scientists from developing countries. In this connexion the Committee urged that adequate funds to cover its share for both purposes be provided in the FAO budget for 1976 or through other means available to the Organization.

108. With regard to publications, FAO had been asked to assume responsibility for compilation and publication of preprinted abstracts for both invited and contributed papers. The Secretariat confirmed that FAO was prepared to undertake this task on the condition that the editing of the abstracts should be arranged for by the Steering Committee and that a realistic timing for submission and processing is agreed upon.

8.5 Cooperative Investigations of the Caribbean and Adjacent Regions (CICAR)

109. The Committee noted that FAO is taking steps to form an international body for the provision of scientific advice for fisheries and related problems for the Central Western Atlantic and reaffirmed its view that this action is timely and bound to be beneficial. It also took note of the cooperative investigations in this area within the CICAR programme under the auspices of IOC with FAO support and recognized the significance of such investigations for fisheries research. It had before it a report, from its representative Dr. C. Tapias, of discussions at the meeting of a CICAR Ad Hoc Working Group, in Cartagena (July 1973), on extending the CICAR programme and maintaining the international exchanges and collaboration developed through CICAR.

110. The Committee understood that IOC is considering the arrangements - including possibly the establishment of a continuing body - to be concerned with continuation of the kind of investigations initiated in CICAR, which latter included fishery investigations and related biological and environmental studies. Should this finally be the case, obviously FAO and IOC should ensure the closest possible cooperation between the two bodies, if and when they are set up. At the same time the Committee felt that attention of governments should be drawn to the possible advantages of establishing a single scientific body. It would seem advisable from the scientific viewpoint for FAO to carefully evaluate the advantages and disadvantages of a merger of the envisaged fisheries body with an IOC body or for expansion of its terms of reference to cover also IOC as well as Unesco interests.

9. INTERNATIONAL COORDINATION AND COOPERATION

9.1 Collaboration with SCOR

111. In introducing this item Professor Wooster, speaking for SCOR, stated that the collaboration between the two advisory bodies had been very satisfactory and effective. He then reviewed briefly the present situation as regards activities of the various Working Groups in which SCOR and ACMRR collaborate, especially the Working Group on Monitoring in Biological Oceanography (WG.29, now disbanded), the Working Group on Biological Data Inventories (WG.32), the Working Group on Coastal Upwelling Processes (WG.36) and the Working Group on Marine Pollution Research (WG.45). It was realized that progress reports on some of these groups had been discussed earlier in the Session (see relevant items), and that the general state of affairs is well summarized and published in the Report on the Seventeenth Meeting of the SCOR Executive Committee, Texel, May 1973 (SCOR Proceedings, Vol. 9).

112. The Committee decided to leave the following related matters for further action by the Chairman and/or Secretariat as appropriate:

(i) to arrange for ACMRR representation at the second meeting of the IOC International Coordinating Group for the Southern Ocean, envisaged for 1974, if the IOC General Assembly (November 1973) approves that meeting;

(ii) to nominate, on behalf of ACMRR, a member to SCOR Working Group on River Inputs to Ocean Systems (WG.46; Chairman: Prof. D. Lal);

(iii) to discuss with SCOR and IABO their plans for a Working Group on Abundance Estimates of Micronekton, and possible cooperation with ACMRR;

(iv) to cooperate with Dr. O. Tandberg (Sweden) who has been asked by SCOR to prepare and convene a session on the role of SCOR in relation to international programmes to promote marine science in developing countries.

APPENDIX 1

AGENDA

1. Procedural Matters

   1.1 Opening of Session
   1.2 Adoption of Agenda
   1.3 Date and Place of Eighth Session
   1.4 Election of Chairman and Vice-Chairmen for the Forthcoming Period of Activity

2. Implementation of Recommendations of the Sixth Session and Other Inter-Sessional Activities

3. Science Policy on Living Aquatic Resources and Environment

   3.1 Scientific Advice to Fisheries Management and Development Bodies
   3.2 Other Matters

4. Survey and Evaluation of Living Aquatic Resources

   4.1 FAO World Appraisal of Fishery Resources Programme
   4.2 Acoustic Research
   4.3 Marine Mammals
   4.4 Scientific Evaluation of the State of Stocks in the Southwest Atlantic

5. Improvement of Living Aquatic Resources and Their Environment

   5.1 Aquaculture
   5.2 Protection of Fishery Resources from Pollution

6. Ocean and Resource Variability

7. Programme of Work and Budget for 1974-75 and Medium-Term Programme

8. Matters concerning the Intergovernmental Oceanographic Commission

   8.1 Integrated Global Ocean Station System (IGOSS)
   8.2 Global Investigation of Pollution in the Marine Environment (GIPME)
   8.3 Training and Education of Marine Scientists and Technicians
   8.4 Second Joint Oceanographic Assembly (JOA)
   8.5 International Cooperative Investigations

9. International Coordination and Cooperation

   9.1 Collaboration with SCOR

10. Other Business

11. Closing of Session

APPENDIX 2

LIST OF INFORMATION PAPERS [1]

ACMRR : 7/73/IP.1	IOC and WMO Subsidiary Bodies Dealing with the Integrated Global Ocean Station System (IGOSS) (IGOSS Programme Information Circular No. 2 (1972), IOC/WMO)
ACMRR : 7/73/IP.2	User Applications of Oceanographic Products and Services (IGOSS Programme Information Circular No. 4 (1972), IOC/WMO)
ACMRR : 7/73/IP.3	International Co-ordination Group (ICG) for the Global Investigation of Pollution in the Marine Environment (GIPME) (Summary Report, First Session, London, 2-6 April 1973) (IOC/GIPME-I/3)
ACMRR : 7/73/IP.4	IOC Working Group on Training, Education and Mutual Assistance. First Session (Unesco Headquarters, Paris, 7-13 March 1973 - Summary Report), IOC/TEMA-I/3)
ACMRR : 7/73/IP.5	Extracts from FAO Programme of Work and Budget for 1974-75
ACMRR : 7/73/IP.6	The Peruvian Anchoveta Fishery
ACMRR : 7/73/IP.7	Stock Assessment of the Peruvian Anchovy and Management of the Fishery
ACMRR : 7/73/IP.8	Report of the Technical Conference on Fishery Management and Development (Vancouver, Canada, 13-23 February 1973) (FAO Fish.Rep. No. 134)
ACMRR : 7/73/IP.9	Report of the Eighth Session of the Committee on Fisheries (Rome, 10-17 April 1973) (FAO Fish.Rep. No. 135)
ACMRR : 7/73/IP.10	Fish Egg and Larval Surveys (Contributions to a Manual) Preliminary Draft (FAO Fish.Tech.Pap. No. 122)
ACMRR : 7/73/IP.11	Proceedings of the Scientific Committee on Oceanic Research (SCOR), Vol. 9, September 1973
ACMRR : 7/73/IP.12	Summary Report of SCOR (WG.32)/ACMRR Working Group on Biological Data Inventories
ACMRR : 7/73/IP.13	Provisional Timetable

---

[1] Unless specified otherwise, the papers were prepared by the Secretariat.

APPENDIX 3

LIST OF WORKING PAPERS [1]

ACMRR : 7/73/WP.1 (Rev 1)	Draft Provisional Agenda
ACMRR : 7/73/WP.1 (Rev.1, Suppl. 1)	Draft Provisional Annotated Agenda
ACMRR : 7/73/WP.2	List of Working Papers
ACMRR : 7/73/WP.3	List of Information Papers
ACMRR : 7/73/WP.4	List of Participants
ACMRR : 7/73/WP.5	A Guide to Research on Fish Behaviour
ACMRR : 7/73/WP.6	Report of the ACMRR/IABO Working Party on Aquaculture
ACMRR : 7/73/WP.7	ACMRR Working Party on Scientific Advice to Fishery Management and Development Bodies, First Meeting - Interim Report
ACMRR : 7/73/WP.8	Report on the Joint ACMRR/CARPAS Working Party on the Scientific Evaluation of the State of the Stocks in the Southwest Atlantic. First Session, Montevideo, 14-17 December 1971
ACMRR : 7/73/WP.9	Aquaculture
ACMRR : 7/73/WP.10	Report of the First Session of the ACMRR Working Party on Marine Mammals. London, 29 June-3 July 1973
ACMRR : 7/73/WP.11	International Symposium on Pacific Pollock
ACMRR : 7/73/WP.12	Manual on Fish Egg and Larval Surveys
ACMRR : 7/73/WP.13	FAO Activities in the Field of Acoustics Research
ACMRR : 7/73/WP.14	Report to ACMRR on the First Session of the IOC Working Group on Training, Education and Mutual Assistance (TEMA), Paris, 7-13 March 1973 - by O.J. Østvedt
ACMRR : 7/73/WP.15	Measurement of Fishing Effort for Stock Assessment and Management Purposes
ACMRR : 7/73/WP.16	Report on Preparation for the ACMRR/IABO Working Party on Ecological Indices of Stress to Fishery Resources
ACMRR : 7/73/WP.17	Second Joint Oceanographic Assembly (1976)
ACMRR : 7/73/WP.18	Present Data Requirements to be met by the Department of Fisheries
ACMRR : 7/73/WP.19	Global Investigation of Pollution in the Marine Environment (GIPME)
ACMRR : 7/73/WP.20	Integrated Global Ocean Station System (IGOSS) (A Progress Report: the service oriented sector; monitoring aspects; the research oriented sector; fishery aspects; requests for future advice from ACMRR)
ACMRR : 7/73/WP.21	Ad hoc Working Group on the Continuation of Cooperative Work in the CICAR Area. Summary Report - by C. Tapias
ACMRR : 7/73/WP.22	Report of the Sixth Session of the Advisory Committee on Marine Resources Research (ACMRR)

[1] Unless specified otherwise, the papers were prepared by the Secretariat.

ACMRR : 7/73/WP.23	Progress Report of ACMRR Ad Hoc Group of Experts on the Facilitation of Acoustics Research. A. Survey of Extent and Status of Current Research B. Note on Informal Meeting of ACMRR Ad Hoc Group of Experts on the Facilitation of Acoustic Research (held in Bergen on 21 June 1973)
ACMRR : 7/73/WP.24	World Appraisal of Fishery Resources
ACMRR : 7/73/WP.24 (Suppl. 1)	World Appraisal of Fishery Resources Programme. First Draft
ACMRR : 7/73/WP.25	Report on the State of Preparations for Working Group on Effects of Pollution on Aquatic Living Resources (1) ACMRR/IABO Working Group on Ecological Indices (See WP.16) (2) ACMRR/IABO Working Group on Biological Effects of Pollutants (3) ACMRR Working Group on Biological Accumulators
ACMRR : 7/73/WP.26	Ocean and Resource Variability (An exchange of correspondence)
ACMRR : 7/73/WP.27	SCOR (WG.36)/ACMRR/ACOMR Working Group on Coastal Upwelling Processes
ACMRR : 7/73/WP.28	Provisional Documentation Relevant to Various Agenda Items
ACMRR : 7/73/WP.29	Progress Report on the Activities of the Working Party on Scientific Advice to Fishery Management and Development Bodies

APPENDIX 4

LIST OF PARTICIPANTS

Members of ACMRR

Dr. A.P. Alekseev *	Director PINRO 6 Knipovich Street Murmansk U.S.S.R.
Dr. D.L. Alverson (Vice-Chairman and Rapporteur)	Director Northwest Fisheries Center National Marine Fisheries Service 2725 Montlake Boulevard East Seattle, Washington 98112 U.S.A.
Dr. A.S. Bogdanov *	Director VNIRO 17 V. Krasnoselskaya Moscow B-140 U.S.S.R.
Dr. L.M. Dickie	Director Marine Ecology Laboratory Bedford Institute Dartmouth, N.S. Canada
Dr. Toshiyuki Hirano	Ocean Research Institute University of Tokyo Nakano Tokyo 164 Japan
Dr. A.R. Longhurst	Institute for Marine Environmental Research 13/14 St. James Terrace Citadel Road Plymouth Devon PL1 3AX U.K.
Dr. A. Mena Millar	Director Centro de Investigaciones Pesqueras (CIP) Calle 26 Miramar, La Habana Cuba
Mr. N. Odero	Director of Fisheries Ministry of Tourism and Wildlife P.O. Box 40241 Nairobi Kenya
Mr. B.B. Parrish	Director, Marine Laboratory Department of Agriculture and Fisheries of Scotland P.O. Box 101 Aberdeen AB9 8DB U.K.

* Unable to attend

Dr. S.Z. Qasim (Vice-Chairman)	Director Central Marine Fisheries Research Institute Post Bag No. 1912 Cochin 682018 India
Dr. H.A. Regier	Professor of Zoology University of Toronto 25 Harbord Street Toronto 5 Ontario Canada
Mr. G. Saetersdal (Chairman)	Director Fiskeridirektoratets Havforskningsinstitutt Nordnesparken 2 Bergen Norway
Dr. A. Suda	Far Seas Fisheries Research Laboratory Japan Fisheries Agency 1000 Orido Shimizu 424 Japan
Prof. K. Tiews	Director Institut für Küsten und Binnenfischerei Bundesforschungsanstalt für Fischerei Palmaille 9 2 Hamburg 50 Federal Republic of Germany
Prof. W.S. Wooster	Rosenstiel School of Marine and Atmospheric Science University of Miami 10 Rickenbacker Causeway Miami, Florida 33149 U.S.A.

ACMRR Working Party on Scientific Advice to Fishery Management and Development Bodies

Dr. C.E. Lucas * (Chairman)	16 Albert Terrace Aberdeen AB1 1XY Scotland, U.K.
Dr. G.L. Kesteven (Co-opted Member)	Project Manager FAO/UNDP Fishery Research and Development Project c/o Instituto del Mar Apartado 3734 Lima, Peru

ACMRR/IABO Working Party on Aquaculture

Dr. C.P. Idyll (Chairman)	Fishery Research Adviser Department of Fisheries, FAO

Prof. G. Hempel (Member)	Direktor der Abteilung Fischereibiologie Institut für Meereskunde an der Universität Kiel Düsternbrooker Weg 20 23 Kiel Federal Republic of Germany

ACMRR Working Party on Marine Mammals

Dr. S.J. Holt (Chairman)	International Ocean Institute Msida, Malta, and Fishery Resources Division Department of Fisheries, FAO

Representatives and Observers of International Organizations

IOC

Mr. D.P.D. Scott	Secretary, IOC c/o Unesco Place de Fontenoy 75700 Paris France

WMO

Mr. G. Verpleogh	Chief, Ocean Affairs Branch Marine and Aeronautical Division WMO Case Postal No. 1 1211 Geneva 20 Switzerland

SCOR

Prof. W.S. Wooster	Rosenstiel School of Marine and Atmospheric Science University of Miami 10 Rickenbacker Causeway Miami, Florida 33149 U.S.A.

IABO

Prof. G. Hempel * (President, IABO)	Direktor der Abteilung Fischereibiologie Institut für Meereskunde an der Universität Kiel Düsternbrooker Weg 20 23 Kiel Federal Republic of Germany

Food and Agriculture Organization

Mr. E.F. Akyüz	Senior Fishery Officer Fishery Resources Division
Mr. E.L. Cadima **	Fishery Biologist (Stock Assessment) Fish Stock Evaluation Branch Fishery Resources Division
Dr. E. Fagetti **	Fishery Biologist Fish Stock Evaluation Branch Fishery Resources Division
Dr. J.A. Gulland	Acting Director Fishery Economics and Institutions Division
Mr. D. Hagborg **	Chief, Fishery Data Centre Fishery Resources Division
Mr. H.F. Henderson **	Senior Fishery Officer Stock Assessment Section Fish Stock Evaluation Branch Fishery Resources Division
Dr. C.P. Idyll **	Fishery Research Adviser Department of Fisheries
Dr. H. Kasahara **	Director of Programme Coordination Department of Fisheries
Dr. H. Naeve **	Fishery Biologist (Marine Pollution) Marine Environment Section Marine Biology and Environment Branch Fishery Resources Division
Mr. C. Nédélec **	Chief, Gear Technology Section Fishing Gear and Methods Branch Fishery Industries Division
Dr. T.V.R. Pillay	Senior Fishery Officer (Aquaculture) Fishery Resources Division
Dr. D.F.S. Raitt **	Chief, Marine Biology Section Marine Biology and Environment Branch Fishery Resources Division
Dr. M. Ruivo	Director, Fishery Resources Division Department of Fisheries
Dr. D. Sahrhage	Chief, Marine Biology and Environment Branch Fishery Resources Division
Dr. G. Tomczak **	Chief, Marine Environment Section Marine Biology and Environment Branch Fishery Resources Division
Dr. J.-P. Troadec	Fishery Biologist Marine Biology and Environment Branch Fishery Resources Division
Mr. H. Watzinger **	Director, Fishery Industries Division Department of Fisheries

** Part time
Other staff members also attended for discussions on certain Agenda Items

Secretariat of the Committee

Secretary	Dr. M. Ruivo
Assisting the Secretary	Mr. E.F. Akyüz Dr. D. Sahrhage
Assistant	Mrs. R.M. Capparucci

APPENDIX 5

LIST OF ACMRR WORKING PARTIES

(as of November 1973)

Working Party on Scientific Advice to Fishery Management and Development Bodies

Working Party on Marine Mammals *

Working Party on Fishing Effort and Monitoring of Fish Stock Abundance (New)

Working Party on the Scientific Evaluation of the State of the Stocks in the Southwest Atlantic (with CARPAS)

Working Party on Aquaculture (with IABO) *

Working Party on Biological Effects of Ocean Variability (New) *

Working Party on Ecological Indices (with IABO) (New) *

Working Party on Biological Effects of Pollutants (with IABO) (New) *

Working Party on Biological Accumulators (New) *

Ad Hoc Group of Experts on the Facilitation of Acoustic Research in Fisheries

ACMRR also co-sponsors with SCOR and other bodies the following groups:

SCOR (WG.32)/ACMRR Working Group on Biological Data Inventories

SCOR (WG.36)/ACMRR/ACOMR Working Group on Coastal Upwelling Processes

SCOR (WG.45)/ACMRR/ACOMR/ECOR Working Group on Marine Pollution Research

SCOR (WG.46)/ECOR/IASH/ACMRR/Unesco Working Group on River Inputs to Ocean Systems

The following ACMRR Working Parties and Groups were disbanded since the Sixth Session of ACMRR (1971):

Working Party on Survey and Charting of Fishery Resources

Working Party on Fish Egg and Larval Surveys

Working Party on the Use of Submersibles and Underwater Habitats in Fisheries and related Marine Biological Research

SCOR (WG.29)/ACMRR Working Group on Monitoring in Biological Oceanography

---

* Financed from extra budgetary sources.

APPENDIX 6

LIST OF ACRONYMS USED IN REPORT

ACMRR	Advisory Committee on Marine Resources Research
ACOMR	Advisory Committee on Oceanic Meteorological Research
ASFIS	Aquatic Sciences and Fisheries Information System
CARPAS	Regional Fisheries Advisory Commission for the Southwest Atlantic
CICAR	Cooperative Investigations of the Caribbean and Adjacent Regions
COFI	Committee on Fisheries
CSK	Cooperative Study of the Kuroshio and Adjacent Regions
ECOR	Engineering Committee on Oceanic Resources
GIPME	Global Investigation of Pollution in the Marine Environment
IABO	International Association for Biological Oceanography
IASH	International Association of Scientific Hydrology
IBP	International Biological Programme
ICES	International Council for the Exploration of the Sea
ICNAF	International Commission for the Northwest Atlantic Fisheries
ICSPRO	Inter-Secretariat Committee on Scientific Programmes Relating to Oceanography (FAO/Unesco/WMO/IMCO/UN)
IDOE	International Decade of Ocean Exploration
IGOSS	Integrated Global Ocean Station System
IOC	Intergovernmental Oceanographic Commission
JOA	Joint Oceanographic Assembly
LEPOR	Long-Term and Expanded Programme of Oceanic Exploration and Research
MARMAP	Marine Resources Monitoring Assessment and Prediction Program (U.S.A.)
NORPAX	North Pacific Experiment
SCOR	Scientific Committee on Oceanic Research
UNCLOS	U.N. Conference on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WAFR	World Appraisal of Fishery Resources
WMO	World Meteorological Organization

APPENDIX 7

REPORT OF THE 1st SESSION OF THE ACMRR WORKING PARTY ON MARINE MAMMALS

Present:	Members:	K.R. Allen S.J. Holt (Chairman) O. Mathisen M. Nishiwaki G.C. Ray
	Ad hoc Group Convener:	R. Gambell
	Technical Secretary:	L.K. Boerema

Absent members: Regrets for their inability to attend the Session were received from A.S. Bogdanov and P.A. Larkin

Introduction

Five members of the Working Party (WP) had met in Vancouver, 15-16 February 1973, with two officers of ACMRR and prepared a planning report which had been given limited circulation. That meeting is hereafter referred to as the "Consultation". On that occasion the following items had been discussed:

1) Examination of terms of reference and consideration of working arrangements.
2) Status of stocks of whales.
3) Status of smaller cetaceans.
4) Status of seal stocks.
5) Mammals and their products in relation to ocean resources.
6) Establishment of ad hoc groups.
7) Consideration of budget.
8) Cooperation with other organizations.
9) Times and places of future meetings.
10) Other business.

After examination of the terms of reference given to the WP (Annex II) it had been agreed that they were extremely comprehensive and that members would have to depend on assistance from many specialists. It was agreed to establish a number of ad hoc groups, primarily by species groups, to accomplish this. The members of these groups would, in addition, correspond as necessary with a wider circle of specialists. A convener of each group would be designated; conveners not being members of the WP. One member of the WP would be assigned to guide the work of each group and help ensure consistency and communication between the ad hoc groups and the WP itself. The Chairman of the WP, as well as the Technical Secretary, would also follow the activities of all groups especially to ensure eventual integration of their studies.

At the present session, the WP adopted the following agenda:

1) Report by Convener on developments since the Consultation, and implementation of its decisions.
2) Report by Secretariat on status of this project, including actions on report of Consultation, agenda items 6, 7, 8 and 10.
3) Establishment and work of ad hoc Groups I, II and III.
4) Report by Dr. Allen on Item 5 of Consultation agenda.
5) Future programme and timetable.
6) Other business.

Item 1

The Chairman reported on his recent correspondence with members, particularly those who had not attended the Consultation. The formation of the ad hoc groups, then proposed, had proved unexpectedly difficult, and some of the scientists whose help had been sought were, although interested, too busy to contribute. It had become clear that the timetable outlined under Item 9 of the report of the Consultation based on completing the work of the WP in two years, and on starting the work of some ad hoc groups by mid-1973 must be revised, and that further discussions were needed in the WP as a whole. Efforts had been made to select a place and date when everyone could attend, but they were only partly successful. Meanwhile, information had been obtained about other international activities concerning marine mammals, which was relevant to the decisions to be made by the WP concerning the fulfilment of its tasks.

Item 2

The Secretary reported first on the situation regarding the financing of this work, which is to be done entirely under trust fund arrangements. Pledges had been received from three governments totalling $40 000 for the first year of work and $10 000 for the second year, it being understood that a further $25 000 would be forthcoming from one of the governments in the second year. Other governments had been approached and their responses were awaited.

A request for substantial support from the UN Environment Programme had been submitted and an advance was being requested for the first phase of the work.

A press release about the FAO interests in marine mammals had been issued from the Technical Conference on Fishery Management and Development in Vancouver, 13-23 February 1973. Although the report of the Consultation had not been widely distributed a verbal report had been given by the Chairman of ACMRR to the April 1973 Session of COFI.

The WP subsequently discussed several matters arising from the report of its Technical Secretary, as follows:

a) Documentation and information

At the Consultation it had been suggested that FAO might build up a comprehensive system for access to documentation on marine mammals. While it did not seem necessary to ask that FAO duplicate existing specialized libraries, it would be useful if it could provide a guide to principal collections, include pertinent references in its general marine science information system, and hold a collection of the most important literature.

In response to this suggestion the Secretariat had prepared an account of its pertinent existing activities and holdings. From this it appeared that references on marine mammals in FAO's "Aquatic Sciences and Fisheries Abstracts" were not comprehensive, and effort should be made to improve the coverage in this respect. The WP invited FAO to prepare and circulate to its members and to the group conveners a list of the periodicals being monitored. On the list should be indicated those from which most marine mammal

references were being taken. Specialized members of the WP and of the ad hoc groups would then be able to suggest additional periodicals which should be covered. The holdings by FAO are rather few. Presuming that the collaborating institutions could on demand supply photocopies of indexed papers, and that the various libraries specialized on marine mammals continued cooperating among themselves, the WP saw no particular problems of access to published literature in most countries. Some of the research had been reported, as for fisheries generally, in documents which had been published in full much later, if ever, and in symposium proceedings. Such documents should be adequately covered in the FAO sponsored system, as also should publications on legislation affecting marine mammals, and the few periodicals which are wholly devoted to marine mammals.

FAO has a register of marine science experts from which those expressing interest in mammals can be extracted. Two existing specialized lists from other resources were tabled by members of the WP; these were judged useful but incomplete, and containing numerous errors of fact or selection. The WP asked that FAO should make available a list of specialists. Meanwhile, the Secretariat should try to augment its basic file with names from existing lists and recent bibliographies. A list of specialists would be useful in the preparation for the conference envisaged under Item 5; the WP judged it might be found to include eventually 300-400 names.

In connection with the list of scientists a list of institutions carrying out marine mammal research could be made. It was not considered necessary to make a separate list of specialized libraries because these would be included anyway in the list of institutions, which need only have an appropriate annotation.

Information about current research programmes circulates informally and broadly among mammal or fishery research workers. One quite effective way was through the IBP Marine Mammal Newsletter published in the U.S.A. Unfortunately, this newsletter, which goes out to about 800 addresses, would probably cease publication late in 1973 and was mostly limited in coverage to the US/IBP Program. It would perhaps require $5 000 annually to keep it going in an expanded form. However, the WP felt there were other priorities in the communication of information than this. It was concerned about the inadequacy of reliable information about marine mammals and their management flowing from scientists to the general public, who were very interested in this subject. The programme of activities drawn up by the WP, especially the proposed Conference, would themselves be helpful in this respect, but something more was needed.

The suggestion, from the Consultation, that individual members of the WP and its ad hoc groups should take on publicity about their work was reconsidered. Instead a more coherent effort should be made, later, and the next meeting of the WP should decide on the means to be used. Meanwhile, the present report, with a suitable introduction to be written by FAO, should be sent soon to all international bodies concerned with marine mammals, and to other interested bodies, national societies and so on.

b) Statistics of commercial use of marine mammals

The Secretary tabled a summary of these, as far as FAO was concerned, prepared in response to a request by the Chairman of the Working Party. Data on whale catches were being obtained from the Bureau of International Whaling Statistics (BIWS), and reported in the FAO Yearbook of Fishery Statistics with little change other than some conversion to different units. The WP thought that the FAO Yearbook should report total weights of whale catches, as well as numbers, and that these should be included in the totals for marine production. Studies made at the Whale Research Unit now gave a good basis for routine conversion of numbers to weights, for the Antarctic baleen and sperm whale industry, and could be extended to the North Pacific. The Technical Secretary was therefore asked to ensure that FAO collaborated with the U.K. Whale Research Unit on this matter,

with a view to inclusion of weights in the 1972 FAO Yearbook of Fishery Statistics if possible. A historical review along these lines would be useful, and the Chairman reported that he was now making such a study, the preliminary results of which would soon be published.

The statistics on whale products needed improvement, particularly to cover meat production; much of the pertinent data existed in national publications.

Statistics on small whales and other cetaceans were at present very poor. The special working group set up under the International Whaling Commission (IWC) would be looking into this matter soon, and the WP would await its findings and proposals. Of larger species included in BIWS tables, the minke whale was treated anomalously - by one criterion at one place and by another elsewhere. It was suggested that FAO should take up this matter with BIWS.

FAO should include weight statistics also for seal harvests. It was agreed that Dr. Ray would prepare, from the literature, and with the help of other specialists (ad hoc Group III), a table of conversion factors to permit this; it was hoped that a first draft could be ready by the end of 1973. Apart from recording the biomass removed from the ocean, statistics by weight would help to assess the present degree of utilization of the harvest and provide a basis for discussion of the need for, and practicability of, fuller utilization of carcasses.

c) Legislation

From the Consultation, FAO had been requested to compile in 1973 information about the nature and application of pertinent existing national, local, and international legislation. The Technical Secretary presented a draft proposal for such a study to be made by a consultant at a cost of about $3 500. The WP approved the draft, and asked that the study be carried out as soon as practicable; this would be most useful for the ad hoc groups and the next stage of its work. The compilation should, as far as possible, cover both powers conferred by enabling legislation and the application of these, but historical reviews were not needed at this time. The material extracted should include more general legislation - as for the establishment of certain marine reserves, and the protection of habitat, as well as the regulation of harvests. Information about international actions should include reference to which nations were bound by international agreement, and should also cover bilateral agreements such as that recently signed between the U.S.A. and U.S.S.R.

d) Contacts with international and some national bodies

At the Consultation a provisional list had been drawn up of organizations which should be invited to send specialized representatives to meetings of the ad hoc groups. At the present session this list was revised (see Annex I). In some cases the specialists expected to attend as representing a particular body would be important additions to the scientific competence of the ad hoc groups, and their attendance should be assured, even if in certain cases it might be necessary to contribute to their expenses from the funds available to FAO.

The bodies listed in Annex I should be sent the present report (with an explanatory letter and the terms of reference of the WP) and would - among others - be consulted concerning the preparations for the proposed Conference.

Item 3

At the Consultation the WP had examined its terms of reference (Annex II) and had agreed they were extremely comprehensive, and that the members would have to depend on assistance from many specialists. The procedure of establishing a number of ad hoc groups, primarily by species groups, had been agreed. A convener of each of them would be designated. He would be informed of the suggested membership of his group. To each group would be assigned at least one member of the WP, and the Chairman would follow, through those members, and directly, all the studies undertaken. Each convener could suggest names to augment the membership of his ad hoc group, to be agreed by the responsible WP member and the Chairman (and, insofar as budgetary considerations were involved, by the Technical Secretary).

At the Consultation it had been decided that the terms of reference of the WP included sea otters and sirenians, but excluded polar bears. It had also been decided to set up three ad hoc groups to consider:

I Whales (right, rorqual, humpback, sperm, minke and grey)
II Small cetaceans and sirenians (including fresh water species)
III Pinnipeds and sea otters

At this session of the WP it was agreed to move responsibility for small whales that are hunted by the same methods as used for great whales (e.g., at least some of the beaked whales) from Group II to Group I. The WP "contacts" within each group were agreed as follows:

I Larkin
II Nishiwaki
III Mathisen

The WP had been given a mandate to determine its own priorities. Account would be taken, by the WP and by the ad hoc groups, of a number of the characteristics of marine mammals, particularly (and not necessarily in this order of significance):

- their economic value;
- their vulnerability to extinction or excessive depletion by man's activities;
- the "intelligence", at least of some species;
- their spectacular position among marine life and their attractiveness to man;
- their scientific interest, as animals highly specialized for diving while retaining the essential link with the air-water interface.

Some species were distributed in waters adjacent to only one or a few countries, some were coastal or inhabit fresh waters, others ranged far and wide. Attention should be given to all species regardless of the relation between geographical distributions and national jurisdictions since the survival of these animals was of interest to all mankind.

The material to be reviewed by the ad hoc groups would not be restricted to published documents.

The WP gave very detailed consideration to the proposed membership of ad hoc groups, bearing in mind range of scientific competence, and of geographic interest as well as likely availability and willingness of individual scientists to assist with this work. A list was provided to the Secretariat with a request that invitations to membership be sent out as soon as possible. In several cases alternative names were suggested, should the person first named not be available. The terms of reference for ad hoc Groups I, II and III are given in Annex III, as drawn up at the Consultation.

With respect to ad hoc Group I, Dr. Gambell had already agreed to be its convener, and could start work with his group, by correspondence, as soon as the Technical Secretary had obtained the agreement of the proposed members.

For Groups II and III, the Technical Secretary would write to the proposed conveners and members, and meanwhile the WP member assigned to the group would begin to prepare a detailed programme of work for his group, keeping in touch with the Chairman to ensure the harmonizing of the programmes as far as necessary.

In Group II, the sirenians presented a special problem. Dr. Bertram (if he accepted membership) would be asked to take particular responsibility for these species. It was understood that the International Union for Conservation of Nature and Natural Resources (IUCN) was considering forming a specialist group for these species. Few workers were concerned throughout the world, and the sirenians offered special opportunities for aquaculture. It was therefore agreed that FAO should consult with IUCN with a view to the ad hoc "sub-group" to be led by Dr. Bertram becoming a joint one with IUCN.

Concerning Group III, Dr. Allen would suggest a possible member from Australia or New Zealand to cover the unexploited sub-Antarctic stocks in that part of the world. Dr. Ray would work with Group III to stimulate and coordinate the review of data on the ice-inhabiting pinnipeds.

Item 4

The task of the WP might be summarized as to determine the present status of marine mammal populations, to identify threats to their well-being, and to strengthen the basis for their rational management to provide optimum benefits to mankind whatever the criteria of optimization might be. This would call for close examination of:

(a) the place of marine mammals in the eco-system and the overall effects on it of man-induced changes in their numbers;

(b) the influences, both deliberate and incidental, of human activities, present and future, on the numbers of the various marine mammal populations;

(c) possible future trends in the utilization of marine mammal resources.

During the later stages it will be necessary to bring the information together in a synthesis which would provide a basis for statements on the broad effects of possible policies. This will require a systems and modelling approach. The first step, however, is to identify as many as possible of the individual processes which comprised the total system and to attempt to determine, at least in a general way, the nature of the relationships to their environment and to human activities. These identifications comprise an appropriate task for ad hoc Groups I, II and III and the scheme given in Annex V might be of value to them in arranging and presenting the appropriate information.

Clearly it was not yet possible to build up fully comprehensive models and, still less, to express all the relationships in satisfactory, mathematical forms or to estimate usefully all the parameters involved. However, there were certain basic biological phenomena which should be taken into account in any models and which would frequently be capable of fairly exact expression, sometimes by analogy of one species with another. Collection and presentation of data of this kind should also be started by ad hoc Groups I, II and III, including, as far as possible, the data listed in Annex VI.

A first synthesis should be attempted by a fourth ad hoc group having terms of reference as given in Annex IV. The WP discussed at length the membership of such a group. It was agreed that members of the WP itself, and the conveners of Groups I, II,

and III should participate, and Dr. Allen was asked to serve as its convener. An additional nine names were selected from among a much longer list of those who could assist with this task, and covering a wide range of competence and experience in mammal research, econometrics, resource management practice and theory, systems analysis and dynamic modelling, and ocean sciences.

This rather large group should start working by correspondence, but should meet when first reports were available from Groups I, II and III. In a final stage, the debate should be taken up in a wider consultation as had been envisaged by ACMRR. This should take the form of a Conference, the objectives of which were provisionally defined as:

1) identifying the needs for management and conservation where none exists;
2) evaluating stock assessments on which present management and conservation actions are based;
3) evaluating existing management and conservation policies and objectives, and their scientific basis;
4) evaluating the scope and scale of current research efforts;

and making proposals on these matters.

Marine mammals exhibit so many features of ocean resource management problems - such as definition of social, economic and scientific objectives, multiple interest in the resource, stock management vis-a-vis eco-system management, species protection, harvest utilization, and so on - that this Conference should be of great interest to those more generally concerned with such matters. Financial support for it might thus be sought from a wide range of sources.

Item 5

The provisional timetable proposed at the Consultation could not now be followed. Groups I, II and III would all need to meet about mid-1974 after working by correspondence; Group IV should meet at end-1974 after the first reports from Groups I, II and III had been circulated, and at that time the WP itself should meet. There would need to be some informal consultations among selected Group III members on a regional basis, before the end of 1973. Mathisen and Ray should first visit the convener of Group III, when appointed, and likewise Nishiwaki, the convener of Group II. If possible Holt and Allen should meet to discuss further the preparations for Group IV. The Chairman and/or the Technical Secretary should attend all ad hoc group meetings.

The WP agreed that its work and that of the ad hoc groups should be preparatory to a Conference on marine mammals to be organized by FAO in cooperation with other interested organizations. This Conference, which might be attended by about 100 persons would have as its main working document the draft report of the WP, including the reports of ad hoc groups. A number of special papers would also be invited. It was agreed that in Autumn 1973 the Chairman would circulate to members and conveners his ideas on the scope, agenda, papers and participation in such a Conference, some provision for which might need to be made in the FAO Programme of Work and Budget for 1975-76. Although the Conference would examine critically the stock reviews prepared by Groups I, II and III, the greatest interest would focus on the matters assigned to Group IV. This latter group might therefore be regarded also as the preparatory committee for the Conference.

The timetable now appeared as follows:

Autumn 1973	-	Contacts of responsible WP members with conveners of Groups II and III.
About November 1973	-	Holt and Allen would meet for one or two days, possibly on the occasion of the Intergovernmental Oceanographic Commission (IOC) Assembly in Paris. Holt circulates a paper about the proposed Conference.
Before end 1973	-	Informal consultations (two or three days each) involving Mathisen and the convener and two or three members of Group III in Moscow (North Atlantic and Arctic species) and in Seattle (assisted by Carleton Ray) [North Pacific and ice-inhabiting species].
April 1974	-	Group II - in Montreal if the IWC Small Cetacean Group meets then, unless the latter is held in conjunction with an IWC sei whale group. If Group III meets at the same time as the IWC Group, arrangements should be made to hold the meetings jointly, at least for part of the time (one week).
April-May 1974	-	Group I - Seattle (?) one week.
July 1974	-	Group III - Tokyo (?) one week.
October 1974	-	Group IV - Honolulu or Santa Cruz (?) one week. Preceded and followed by one or two day sessions of WP.
Late 1975	-	FAO Conference on Marine Mammals.
Spring 1976	-	Final Session of WP.

Possibility of one meeting of each Group and of WP during 1975 to be left open for decision in October 1974 in the light of progress made.

The Technical Secretary was asked to re-cost the budget which had been drawn up at the Consultation, in the light of the decisions and proposals of this session of the WP.

Item 6

The WP reviewed the draft first part of this report, and empowered the Chairman to incorporate corrections, to draft the rest of the report and to arrange for it to be circulated to the members as soon as possible.

There being no other business the session adjourned at noon, 3 July, appreciation being expressed to the Whale Research Unit of the U.K. Institute of Oceanographic Sciences as hosts to the WP.

ANNEX I

CONTACTS WITH INTERNATIONAL AND SOME NATIONAL BODIES

		Ad hoc Group
IWC	International Whaling Commission	
	Scientific Committee (Chairman D.G. Chapman, 1973-74)	I
	Working Group on Small Cetaceans (Chairman E. Mitchell)	II
IUCN	International Union for the Conservation of Nature and Natural Resources	
	Survival Service Commission - Whale Specialist Group (Chairman M. Nishiwaki, assisted by S. Brown; membership includes R. Gambell, S.J. Holt and D. Chapman)	I
	SSG - Seals Specialists Group (Chairman K. Kenyon; membership includes M. Nishiwaki)	III
	IUCN might establish a group on sirenians	II
IBP	International Biological Programme	
	PM Mammal Group (Chairman G. Carleton Ray. Programme finishes in 1974)	(I, II, III)
ICNAF	International Commission for the Northwest Atlantic Fisheries	
	Panel A (Seals) - (Chairman Group of Scientific Advisers A.W. Mansfield)	III
NPFSC	North Pacific Fur Seal Commission	
	Standing Scientific Committee (Chairman A.W. Mansfield)	III
ICES	International Council for the Exploration of the Sea	
	Marine Mammal Committee (Chairman A.W. Mansfield, members include A. Jonsgard, N. Bonner)	I, II, III
Antarctic Treaty Organisation		(III ?)
Convention for the Conservation of Antarctic Seals		III
	(Depositary: Government of the United Kingdom of Great Britain and Northern Ireland)	
SCAR	Scientific Committee on Antarctic Research, of the International Council of Scientific Unions	
	Group of Specialists on Seals (Chairman R. Laws, members include D. Siniff, T. Øritsland)	III
IATTC	Inter-American Tropical Tuna Commission (Director of Investigations Dr. J. Joseph)	II

		Ad hoc Group
ICCAT	International Commission for the Conservation of Atlantic Tunas (Executive Secretary Dr. O. Rodrigues Martin)	(II)
JCRFBS	Joint Commission for Regulation of Fishing in the Black Sea	
	(contact through Dr. A.S. Bogdanov)	II
Norway-USSR Treaty (T. Øritsland and A. Popov are connected)		III
Norway-Canada Treaty (T. Øritsland and A.W. Mansfield are connected)		III
PCSP	Permanent Commission of the South Pacific (Scientific Sub-Secretary Dr. R. Bobenrieth)	I
UNEP	United Nations Environment Programme Secretariat	
	(Interested in task of Group I and possibly also of II and III)	
USA-USSR Agreement on Environmental Questions		
	[contacts through CEQ (USA) and Acad.Nauk (USSR)]	I & III
BIWS	Bureau of International Whaling Statistics	
	(contact E. Vangstein)	(I & II)

NB: ( ) denotes keep informed, but special representation not invited, except for specific business.

ANNEX II

TERMS OF REFERENCE OF THE WORKING PARTY

To examine, and report to ACMRR on, the identity, distribution and status of stocks of marine mammals which are, have been, or might soon be subject to exploitation by man, killed accidentally when fishing for other marine living resources, or which are affected by other human maritime activities.

The Working Party should examine past and existing research programmes and their results and, in the light of relevant decisions or recommendations of the IWC, COFI, the UN Conference on the Human Environment, and the UN General Assembly, identify any significant gaps and weaknesses in these. The Working Party should seek to cooperate with, and take account of the activities of the above bodies and of the IUCN, SCOR, fishery councils and commissions concerned with marine mammals, and other intergovernmental bodies. The effects of present and possible future management actions should be appraised, as well as any known or likely effects of marine pollution. Any evidence of relationships between the stocks of marine mammals and other marine resources ecologically linked with them, such as the organisms on which they feed, should be appraised.

The Working Party should examine the distribution and nature of present exploitation and of the products insofar as these bear on the evaluation of likely future exploitation and management regimes. The Working Party should decide itself on the priorities within its task and should take account of ecological and behavioural and other biological investigations, as well as research on the dynamics of mammal populations.

To this end the Working Party should consult scientists, industrial operators and other groups concerned as widely as practicable. Its draft report will be made available to national and international mammal committees and bodies for their consideration, and will also be discussed at a technical seminar (workshop) to be convened by FAO, of which FAO will seek co-sponsorship by other interested organizations.

ANNEX III

TERMS OF REFERENCE OF AD HOC GROUPS I, II AND III

I Whales
II Smaller cetaceans and sirenians
III Seals and sea otters

Each group will comprise a small core membership of specialists nominated by the Working Party (of which one is designated convener), plus one member of the Working Party who will provide the necessary liaison between the group and the Working Party. Each group may propose changes in its membership, subject to agreement by the WP member concerned and the Chairman of the WP, and, insofar as financial considerations are involved, by the Technical Secretary. Each group should seek widely whatever advice and consultation it may require.

Tasks

1. Each group should examine and report to the Working Party on: the identity, distribution and status of stocks, particularly those which are, have been, or might soon be subject to exploitation by man, killed accidentally when fishing for other marine living resources, or which are affected by other human activities.

2. Each group should examine past and existing research programmes and their results and, in the light of relevant decisions or recommendations of IWC, COFI, the UN Conference on the Human Environment, the UN General Assembly, and other agencies, identify any significant gaps and weaknesses. The nature, effectiveness, and effects of present and possible future actions to manage the stocks or their habitats should be appraised, as well as any known or likely effects of marine pollution, or of other uses of the marine and coastal environment. National, as well as international, actions should be considered. Evidence of relationships between the stocks of marine mammals and other marine resources ecologically linked with them, such as the organisms on which they feed, and the consequences of these relationships, should be appraised.

3. Each group should decide on priorities among its tasks and should take account of ecological, behavioural and other biological investigations, as well as research on the dynamics of mammal populations.

4. Each group should examine the nature, quantities, uses and market trends of products obtained by exploitation of the species with which it is concerned.

ANNEX V

SCHEME FOR PRESENTATION OF RELEVANT INFORMATION

1. Effects on eco-system of changes in size of marine mammal population

   1.1 Effects on health and productivity of total eco-system

      1.1.1 Transfer of nutrients (e.g., "ploughing" by walruses, non-utilisation of food species)

   1.2 Effects on balance between species

      1.2.1 Between species for food (e.g., baleen whales)

      1.2.2 Food competition between dissimilar forms (e.g., prawns and dugongs)

      1.2.3 On parasites and alternate hosts of parasites (e.g., seals and cod worm) with two or more stages

      1.2.4 Behavioural relationships (e.g., tuna and porpoises, seal species on rookeries)

2. Effects on human requirements and activities of changes in size of marine mammal populations

   2.1 Predation on resource animals present or potential (e.g., seals and cod or salmon)

   2.2 Competition with resource animals (e.g., dugong, turtles, prawns)

   2.3 Effects on quality of resources (e.g., seals and cod worms)

   2.4 Consumption of vegetation in waterways (e.g., manatees, dugongs)

   2.5 Influence on fishing activities

      2.5.1 Useful (e.g., porpoises and tuna)

      2.5.2 Harmful (e.g., seals and nets)

3. Human activities, other than exploitation, affecting size of marine mammal populations

   3.1 Direct destruction

      3.1.1 In commercial fishery operations (e.g., porpoises in tuna nets, dugong in shark nets)

         3.1.1.1 Extent of effects

         3.1.1.2 Possibility and consequences of prevention

      3.1.2 In other aquatic operations (e.g., dugong in shark protection nets)

      3.1.3 By toxic pollution (e.g., whales off Corsica)

ANNEX IV

TERMS OF REFERENCE OF AD HOC GROUP IV

To undertake a systems analysis, to the level which the available data will allow, of the relation of marine mammals both to relevant aspects of the marine eco-system and to the human community. The specific object of the analysis to be the development of an approach to ascertain:

(a) the place of marine mammals in the eco-system and the overall effects on it of man-induced changes in their numbers;

(b) the influences, both deliberate and incidental, of human activities, present and future, on the numbers of the various marine mammal populations;

(c) possible future trends in the utilisation of marine mammal resources;

in order to provide a basis for optimum policies for management and conservation of marine mammals and their environment.

3.2 Destruction of food supply

3.2.1 By fisheries (e.g., Pacific fur seal and Alaska pollock)

3.2.2 By pollution (e.g., porpoises in the Adriatic, dugong and herbicides)

3.3 Damage to critical habitats (e.g., harbour seals in Mugu lagoon, grey whales in South California)

3.4 Tourism and establishment of sanctuaries

4. Factors influencing future trends in the exploitation of marine mammals

4.1 Social factors

4.1.1 Public reaction to hunting

4.1.2 Changes in social demand for products (e.g., fur)

4.2 Technological factors

4.2.1 Existing products and uses, changes in demand (e.g., lubricants)

4.2.2 New demands for existing products (e.g., sperm whale meat)

4.2.3 New products (e.g., biochemical)

4.3 Uses of live animals (e.g., defence, bio-medical and physiological research, display)

4.3.1 Display in captivity

4.3.2 Scientific research (e.g., bio-medical, physiological)

4.3.3 Work (e.g., defence, assistance in sub-surface operations)

NB: . Economic factors are not included here because they are essentially the mechanisms through which the social and technological factors operate, rather than the basic causes in themselves. They will require examination in a later stage of the study.

ANNEX VI

SCHEME OF RELEVANT DATA BY SPECIES

1. Trophic relationships

1.1 Food and feeding

1.1.1 Food habits, qualitative and quantitative

1.1.2 Temporal and spatial distribution of food species

1.2 Utilisation of food

1.2.1 Proportional food requirements (% body weight)

1.2.2 Efficiency of utilisation

1.2.3 Metabolic requirements

1.2.4 Caloric value and chemical composition of food

2. Demography and population dynamics

2.1 Spatial and seasonal distribution and abundance

2.1.1 Population size

2.1.2 Population biomass

2.1.3 Limiting factors on distribution

2.1.4 Limiting factors on production

2.2 Social behaviour and grouping

2.3 Population dynamics models

2.3.1 Intra-species processes

2.3.2 External relationships and limiting factors

MR/E6129/E/3.74/1/1000